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The LONDON NATURALIST

The Journal of
THE LONDON NATURAL
HISTORY SOCIETY

FOR THE YEAR
1951

No. 31

**PRICE 7s 6d, OR COMPLETE WITH
THE LONDON BIRD REPORT, 10s.**

PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY.

DATE OF PUBLICATION,
JUNE 1952.

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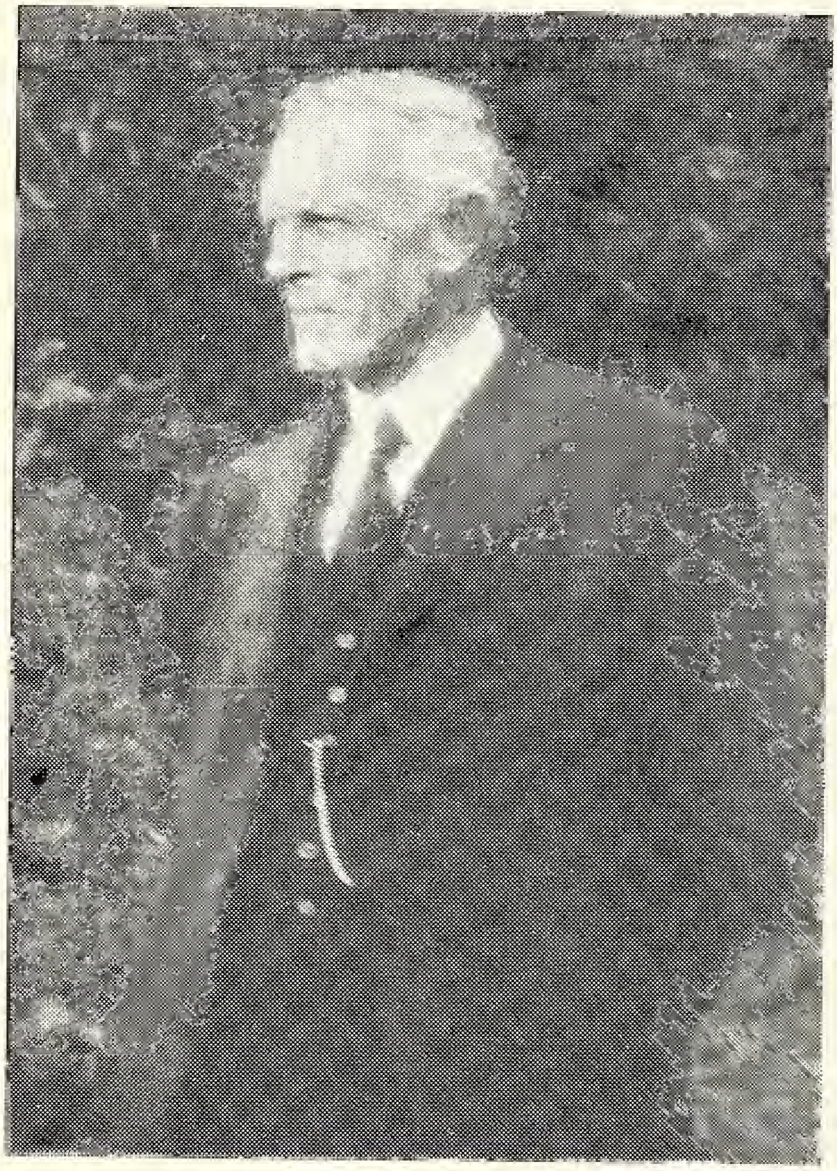

J. A. SIMES, O.B.E.

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Editorial.

THIS year's *London Naturalist* should have contained a complete list of members which, under present arrangements, should be published every third year. Unfortunately, it has been found necessary to postpone publication of this list until next year, partly to make room for the numerous papers which have been submitted this year and partly in the interests of economy. The cost of publishing the *London Naturalist*, like all the other expenses of the Society, is steadily increasing. In addition, no grant has yet been received from the Royal Society for the *London Naturalist* No. 30. This has placed a severe strain on the resources of the Society, although it is to be hoped that this will to some extent be relieved if and when a grant is received. In the meantime, in order to avoid the necessity for a further reduction in the length of the *London Naturalist*, the Council has decided to appeal for donations to the Publications Fund. Publication of the *London Naturalist* is one of the major functions of the Society, for it is only in this way that the results of members' work can be placed on record. It is, therefore, hoped that members will help to overcome what should be a temporary difficulty. All donations should be sent to the Assistant Hon. Treasurer, Mrs Small, 13 Woodfield Crescent, W.5.

A special effort has been made to achieve early publication of the *London Naturalist* this year. The *London Bird Report* will be published separately in due course.

President's Address, 4th December 1951.

By L. Parmenter, F.R.E.S.

Birds and Flies.

THE great charm of birds has attracted many hundreds of Londoners. Most are content in looking at them and feeding them, enjoying their colours and their tameness, not bothering about their names. Millions of Londoners throw crumbs to the Sparrows and Starlings; thousands have bird tables in the garden and hundreds feed the ducks, gulls and pigeons of our parks. The more inquisitive try to find out their names from the many bird books in the libraries. Many of these feeders of birds are attracted sufficiently to want to know more of their lives and may be fortunate enough to be introduced to this Society. Here and in the field, we meet to study the birds whilst appreciating their great appeal. The experts teach how to identify by sight and sound, where and when to search for them and above all *how* to study them.

But to each of us is given our own viewpoint. The particular charm of birds to us may be their tameness. I well remember my delight when one day in Kensington Gardens, Blue and Great Tits first flew onto my hand seeking food. Another day when sheltering with my wife under a tree from the rain and there joined by an immature speckled-breasted Robin that commenced his first efforts at song, we remembered the pleasure Earl Grey, our first Honorary President, had in taming the Robins of his garden at Falloden. Some of you may have experienced as we did the delight of watching Miss Hibbert-Ware's tame birds at Gilwell Park near Chingford. At other times it may be their song. I recall in my schooldays standing in a group of some 12-15 people in a lane watching an early-arrived Nightingale, not skulking as is usual, but singing in a tree, in full view. Probably none of us were members of a natural history society (no notebooks were evident) but merely charmed by the flood of liquid sound from the bird's throbbing throat. Perhaps the most delightful Nightingales we have heard were those near Oxted when with an old Past President, the late R. W. Robbins. We were passing Beatrice Harrison's home, and her father, noting our interest, invited us in to see the garden where the world famous cellist played her broadcast duets with the songsters.

The flight of birds is another attraction: the flash of their colours as the plumage is expanded as they rise and fly, or curve and display in their courtship. Who can remain unmoved when seeing a Peregrine? I remember one that glided from over a plantation in Richmond Park frightening the ducks on the Penn ponds and slipped away over Isabella plantation. Others I have seen dash at waders, who yelled in terror, over the mud flats in Cornwall and Pembrokeshire. The falcon gliding onwards effortless past miles of cliff. One at Cuckmere Haven power-dived at a Woodpigeon catching the bird as it approached shelter in a tree. The impact resounding across the valley.

Maybe it is the courtship antics which appeal most to you. Surely no one can read Selous's volumes and remain unmoved. It may be that the immediate charm is created by the drumming of Snipe, the roding of Woodcock, the strutting of cock Chaffinches or the graceful bowing of Woodpigeons. To many, however, I fancy the chief charm comes from the courting ducks whether whistling Wigeon and Teal or the commoner Mallard. Their entrancing plumage, their musical notes and their patterns of movement and display remind one of the Ballet. Personally I regard the display of the Goldeneye as first favourite. Most of you have probably watched the drake in his best display when he thrusts his head forward with raised feathers of cheek and crest, and rising up, stretches his neck with his bill pointing to the sky, then calling throws the head back with nape touching his tail coverts, and then shooting forward as he brings his head and breast back into normal position, sprays his back with a fountain of water kicked up from behind by his orange legs as his whistle comes echoing across the water.

Our first photographing of a bird on its nest excites us but I believe that for the majority a more sustained interest comes from our first appreciation of migration. It may be the first handling of a trapped bird and the placing of the numbered ring on its leg or the sight, such as I once had, of hundreds of Swallows flying south-west, about one to two feet from the ground, across Hyde Park, dropping over the roofs about the Marble Arch and sweeping forward to, and across, the Serpentine. Another red letter day was when on one of our Ornithological Sectional field meetings we saw some 200 or so Sandwich Terns moving up river and at times resting on the posts and mud banks near Stanford le Hope.

In your reading of bird books you will have found many references to flies. A perusal of T. A. Coward's Life of the Wayside and Woodland will have suggested that the study of insects and in particular the flies or diptera offers a wide scope for adding to our knowledge of the habits of the fauna of this country. You will have read that some flies are found on birds, that some attack and kill nestlings, and that enormous numbers are consumed as food by birds. We confirm these statements ourselves in our own bird studies. As for myself, I have gradually become more and more interested in flies probably chiefly because so little has been written of their habits.

In this interest in both birds and flies I have never been alone. Harry Witherby came back from a long trip to Spain after birds, delighted to have found and photographed an Asilid fly which had killed a dragonfly. A. W. Boyd and T. A. Coward both bred and captured flies for the Manchester Museum. Julian Huxley and David Lack collected flies when studying Gannets at Grassholm and the present Hope Professor of Entomology at Oxford is both a dipterist and an enthusiastic bird-watcher.

Let us then consider these small creatures, their association with birds and also something of their own lives.

Flies number well over 5000 species in Britain. As you all know they are recognised from other insects by having but a single pair of wings and a pair of knobbed stalks behind called halteres. They are almost all bred from eggs passing through a stage as a maggot or other larval form then through a resting stage as a pupa, finally emerging as adult flies. In size they vary from a pin point to one and a quarter inches in length of body and two and a half inches in wing-span. In even the smallest, there is packed the complex machinery which enables the fly to travel distances that are enormous for its size, which enables its intelligence to be used and the courting, mating and propagation of its kind to be continued.

Just as we suffer from gnat bites so do birds, for certain Ceratopogonidae, minute little gnats, suck them. But other flies found on birds seem harmless. Netting birds for ringing you will have come across Hippoboscid flies such as *Ornithomyia avicularia.* It has been found on Blackbirds, Thrushes, several Owls, Starling, Green Woodpecker, Woodpigeon and Jackdaw among others. In the north another species, *Ornithomyia lagopodis* is found on Red Grouse, Golden Plover, Curlew, Arctic Skua, etc. A smaller species of this genus called *fringillina* has been caught on Robin, Hedge-Sparrow and Whitethroat. In these species the egg is retained in the female and the larva grows inside her, being extruded when just ready to pupate. The pupa will overwinter in a nest and the fly hatches in the spring. We need to know much more about their habits, to know all their hosts—facts that only ornithologists will be able to obtain. Whereabouts do they occur on the bird and what is their function when fastened thereon? These are matters which might be best studied by someone keeping pigeons who could introduce the flies to his pets and examine the latter from time to time. But every scrap of evidence is worth obtaining, and specimens of the flies with details of their host, when and where found would be welcomed. Other species of the family of flies are confined to Swallows, Martins and Swifts. A unique specimen of another species, *Ornithoponus ardeae*, was taken from a dead Purple Heron in Pembrokeshire.

But birds' nests house many species besides these. Numerous species and even whole sub-families seem to be confined to birds' nests—Caninae, Trixoscelinae. Various Muscidae are only known from specimens bred from birds' nests by an old L.N.H.S. member. One species is a killer—for the grubs of *Protocalliphora azurea* attack nestling Swallows and Sparrows, sucking them till the birds die. Flies have been reared from the nests of the city Black Redstarts, in this case, fortunately only a harmless fly was present.

But the chief connection flies have with birds is that they form part of, and in many cases bulk largely in, the diet of many birds. Glancing through the Handbook of British Birds I have noticed that no less than 240 species of birds are specially mentioned as feeding on Diptera. They include species like the Crossbill, Waxwing, Nightingale, Hoopoe, Roller, Little Owl, Heron and Little Ringed Plover besides the obvious Flycatchers, Martins, etc. The food of some Sandpipers has in fact been found to contain 50% of flies. Fifty-four cranefly larvae were found in the stomach of a Common Crane. A Black-winged Pratincole captured at Fair Isle had its stomach crammed with the seaweed-haunting *Fucellia* larvae. Recently we have had Eric Hosking's photographs in "British Birds" showing flies in birds' mouths. Some years ago during a B.T.O. enquiry on Swallows it was shown that the flies taken were extremely varied. They included many families:—Mycetophilidae, Sciaridae, Bibionidae, Simulidae, Chironomidae, Ptychopteridae, Tipulidae, Anisopodidae, Stratiomyidae (6 species), Tabanidae, Rhagionidae, Empididae, Dolichopodidae, Lonchopteridae, Phoridae, Syrphidae, Tachinidae, Calliphoridae, Muscidae, Cordyluridae, Opomyzidae, Borboridae, Ephydridae, and Sepsidae. As you know the Swallow likes flying over water and also flies round farm animals as they walk in the fields disturbing the insects. It is not surprising therefore that the moisture-loving and the dung-breeding species of flies were most often taken. The principal victim was *Dilophus febrilis*, far outnumbering the other species, and only males were taken. In this fly, the males congregate in the air flying to and fro fairly slowly. They are dark and conspicuous and do not dart away on the approach of danger.

Mr. J. E. Roberts, at one time recorder for Hampton and Bushy Parks, once found a Common Buzzard feeding on fly maggots in a large toadstool. Another L.N.H.S. member, Mr. Chandler of Limpsfield, sent me some Trichocera, winter gnats, forming the food of a Wren. I have myself recorded in *British Birds* and elsewhere the observing of flies forming the food of Starling, Rock Pipit and Garden Warbler. If any member is able to let me have specimens taken by birds (say out of nestling mouths), or observations, I should be grateful. For example, midges abound at the reservoirs in the summer, and Swifts, etc., probably can be seen to feed in a cloud of midges. As each cloud is generally composed of one species of midge a capture of a few specimens would help in adding to our knowledge of the birds dietary.

These flies are all fascinating in themselves. Whereas in a few years around and about London we may get to know some 200 species of birds we have about twenty times that number of flies to consider. Their identification needs care, and collections and referees need consulting, but rapid progress can now be made. The society has a type collection and a well-illustrated introduction in the book written by our member, Mr. C. N. Colyer, in collaboration with Mr. C. O. Hammond, entitled "Flies of the British Isles", which has joined Miss Longfield's dragonfly book in the Wayside and Woodland series of Warnes.

Already several competent ornithologists are paying attention to the migration of flies—Dr. David Lack, Dr. Beven and Mr. Burton and others in the north of England.

The colours and texture of the covering of flies are delightful but just as field-glasses are needed for aid in bird study so hand lenses and, if possible, low power microscopes are necessary if we are to appreciate fully the beauty of flies.

Under a hand lens the plumage of a bird is still interesting but loses some of its attraction and a butterfly's patterned wings look like a badly tiled roof but the iridescence of a fly is more attractive when magnified and closely examined. The peculiarly shaped feathers of the Hawfinch and Skuas have hundreds of counterparts in the flies with their peculiarly shaped antennae and legs.

We spoke of the attraction of song in birds, but the delightful hum of a summer's day when clouds are absent and the sun shines unshaded is caused by the singing of flies—mostly hover-flies. Their humming appears to be produced by the expulsion of air through the spiracles of the body and not by the movements of the wings. One recalls the caressing note of the Mosquito as it approaches to give us that kiss at night, more bloody than beloved. The note of the various hover-flies changes as the fly rises from a leaf by the woodland path to poise in a sunlit patch overhead. The bass of the fly choir is surely that of the large Tabanid flies as they swoop around us booming like some war-time bomber.

We were earlier considering the flight of birds but compared with that of most flies, the wing beats and flight control of even terns seem clumsy, especially alongside that of many flies such as Pipunculids. These can hover in our tiny collecting tubes, wing tips almost touching the sides. The tiny dainty Choropid flies can slowly lower themselves as if on a wire to the tip of a leaf. One is soon amazed at the swiftness and perfect control as the Hover-flies and the bee fly *Bombylius major* and other Bombylidae dart away even flying backwards as fast as forwards. The soaring of gulls and birds of prey has its counterpart in the patrol flights of the groups of males of many families of flies—*Dilophus, Bibio, Hydrotaeae, Fannia, Empis, Rhamphomyia* and several Stratiomyidae. Flying and alighting on a ceiling appears to be an accomplishment of all species of flies, where they are more comfortable than most birds that assume an upside down position on a tree branch.

The courtship displays of birds have been mentioned but those of the flies are more varied. In most genera of the Syrphidae—the Hover-flies—the males hover awaiting females, humming whilst doing so. Their bright colours, however, must be wasted on the female. The mating approach is made from above and also the colour pattern in male and female is often alike. The dancing and wing-waving of Redshanks finds its counterpart in several families of wing-waving flies such as Trypetidae, Otitidae and Sepsidae. The flight displays of many of the Dolichopodidae are entrancing to all observers—the species of *Argyra*, the green males with their silver powdering flashing as the fly swings to and fro in short dashes up and down its chosen beat. Sometimes on broad leaves but generally on wet mud we find species like *Dolichopus plumipes, D. popularis* and *D. planitarsis*, with decorated tarsi—plumed, or flattened and silvered. These males wave their legs that bear these ornamented tarsi as they balance themselves on four legs near the female. In some species the males are more excited and dance often springing sideways to and fro over the female. In *Poecilobothrus nobilitatus* the silver-tipped smoky wings are waved or rather flashed to and fro as the males gather excitedly about the females.

Just as the Chaffinch will strut before his intended so some of the Diptera perform on land or leaves. At Kew, in one of the hot-houses, I once discovered a tiny fly *Chrysotus pallidipalpus*, known in the wild only in Hawaii but now spreading throughout the world in hot-houses. The males have enlarged palpi dusted with light gold that flash and shine like minature headlights as the males run here and there seeking the females. On the seaweed-draped rocks below Dale fort we found another Dolichopodid—*Aphrosylus raptor*—with large silvered palpi in the male which flashed as the fly strutted along swinging its shoulders.

But the most interesting courtship and mating habits are probably those of various Empididae. They recall the passing of food by the Harriers such as many of us have seen in Broadland. In May, one finds under trees *Empis femorata*. The males will fly to and fro and capture with their strongly bristled legs the males of other flies such as *Fannia* or *Dilophus* as they patrol beneath the tree canopy. The prey is killed by piercing with the proboscis and handed over to the female Empid as the male couples with her. The St. Mark's fly, *Bibio Marci*, a big black fellow with trailing legs, can be very active on the wing on hot sunny days about hedges and thorn trees. Here it falls a victim to the largest Empid in Britain—*Empis tessellata*—again the male makes the capture and passes the prey to the female.

Species of *Rhamphomyia*, another genus of Empididae, have been watched gathering and giving similar wedding presents. In the genus *Hilara* the habit has been evolved further. Several species occur at Bookham Common and were there studied by our member, Mr Garrett-Jones. The males of this genus have an enlarged tarsal joint on the front pair of legs from which they are able to spin a silken thread. The males fly here and there low over the surface of pools and ditches of the common. In one species they capture a small fly—a tiny Chironomid possibly—and spin a web round it as if placing the prey in a bag, which is then passed to the female before mating. In another species only the bag is spun and the female is awarded but an empty sack.

As to feeding, how disgusting the birds appear when considering the tearing of food by a Kestrel or Peregrine—it recalls films of Tudor times. But how dainty is the sipping of our blood by Mosquitoes, be they *Anopheles* or *Aedes*, by the grey clegs of the marshes and the golden *Chrysops* so bejewelled with their red and green-spotted eyes. Grasses are torn by the beaks of many birds but the grubs of the flies of several species neatly scrape their way, eating as they mine their twisting tunnels in the leaves. *Bombylius* and *Rhingia* sip their drinks of nectar from blossom after blossom in the daintiest of ways. Most of the Syrphidae rasp the pollen from the overloaded anthers and carry the fertilising dust to other plants.

We have admired the courage of small birds attacking larger foes at nesting times and similarly we can admire the flies that hunt and kill large prey. The handsome *Asilus crabroniformis* I have seen capture, on more than one occasion, heavy, armour-plated grasshoppers and predatory beetles. At Oxshott, I have found a small Asilid, *Lasiopogon cinctus,* that had killed a blue dragonfly about three times its length.

Certain flies are found riding on the wings of dragonflies. Others such as *Phyllomyza securicornis,* which occurs at Mitcham Common, ride on other flies and on alighting feed like jackals on the food of the larger fly. The habits of flies are so varied that one cannot adequately even hint at them this evening.

As to protection, birds have powerful societies such as the R.S.P.B. in this country and Audubon societies of America looking after their interests. Insects, especially flies, must depend more on the work of the Nature Conservancy for guardianship in Britain. The collector can rarely exterminate a species but the destruction of the habitat—and these are often remarkably small areas—finishes the species. The reproduction of flies in the majority of species is rapid and gaps are quickly filled provided the breeding habitat conditions are suitable. A small bush on the common near my home is festooned with White Bryony. This has for years supported an inbred relict colony of a Trypetid fly—*Orellia wiedemanni.* The enormous damage caused by youths and the farming attempts of the local council beside the bush have not affected the colony.

Birds of many species need flies for food. A bush-dotted area will not attract warblers for nesting unless the area around can support an abundance of insects. Therefore to appreciate the type of conservancy required for many birds will call for a study of the needs of the small animals, the flies and other insects, forming their food.

The study of flies will add to the basic knowledge of nature. Diptera can be studied indoors as well as outdoors and so wet days can be as profitable as dry ones. The slow of foot can gather knowledge as useful as the more nimble student. Miniature zoos can be established at home without upsetting people, whereas most of us dislike the caging of wild birds. A note-book, pencil, a pocket lens, a few corked tubes and a jam pot or two for breeding will provide us with plenty of study material.

The present flow of Diptera handbooks in this country with the regular output of articles and notes in the entomological journals suggests we are just commencing an era of increasing study of flies. Past and present members of this society—Bacot, Gillette, Colyer and others have already played an important role in dipterology. If my words this evening have interested you I am pleased; if they persuade some to assist in advancing our knowledge in however humble a way I shall be delighted.

I thank you sincerely for your forbearance throughout my term of office, for your loyal support to the Society and for staying this evening to listen to me.

Botanical Records for 1951.

Compiled by J. EDWARD LOUSLEY.

THE present series of annual reports on plants found in the London Area was commenced in 1943 with two main objects in view. The first was to encourage members to report their observations so that a revised edition of the Society's *Botanical Records of the London Area* would provide a reasonably adequate account of the flora of our district. Comparison of the first part of *A Hand List of the Plants of the London Area*, published in December 1951, with the earlier work will indicate the excellent response to this appeal.

The second object was to place on early record the more important discoveries year by year, and to give additional information which might be out of place in a formal work. Preparation of the manuscript of the *Hand List* has shown that these annual notes will be of permanent value in this respect; users of the main work interested in particular records will be able to refer back in many cases to the annual report of the year of record to obtain lists of associated species and other details. It is therefore proposed to continue the present series on the same lines as hitherto but, since supplementary records will be collected together in a supplement at the end of the *Hand List*, the selection published each year will be even more restricted than in the past. It is hoped that members will understand that their help in contributing records is appreciated even if they do not appear in print immediately. The 1951 contributions have been so numerous and so interesting that the selection has been exceptionally difficult to make.

The weather in the London Area in 1951 was not particularly favourable to botanical activities in view of the heavy rainfall which made examination of pond margins and swamps difficult. At Greenwich the rainfall for the year amounted to 32.53 in., about 138% of the average. The first five months were particularly wet and at Greenwich the rainfall for January to May exceeded that for the corresponding period in any year since measurements commenced in 1815. Although sunshine (at Kew) was a little above the average, and June was a very sunny month, there were no really hot days so that vegetation never became dried up. Flowering in spring was late, and it was not until well into June that it caught up to normal dates. On the other hand it continued well into the autumn although many tender species were caught by frosts of exceptionally local incidence in early October.

V.-c. 16, WEST KENT.

One of the most pleasing discoveries of the year was that of Pheasant's Eye, *Adonis annua* L., in a cornfield on Stone Marshes in June by J. H. McCall. A century or so ago this species was found "abundantly" in these marshes but there appear to be no recent records. In September, H. M. Pratt found two plants of the Pheasant's Eye in a field near Darenth Wood.

On September 23rd, I joined Mrs. B. Welch and Lt.-Col. J. Codrington in a visit to North Kent. On Erith Marshes we found a most interesting stretch of *Phragmites* swamp where, for a short distance, it was almost possible to imagine ourselves in the Norfolk Broads. This should repay more careful examination under better weather conditions but *Sium erectum* Huds. and *Rumex palustris* Sm. were amongst the plants observed, while nearby we found a number of species characteristic of brackish meadows. We then proceeded to Erith, where a little east of the town, *Geranium rotundifolium* L. was plentiful, and *Nicandra physaloides* Gaertn. occurred on spread ashes. The dykes and saltings towards Crayford Ness proved quite rich in maritime plants including *Ranunculus Baudotii* Godr., *Scirpus Tabernaemontani* Gmel., *Puccinellia rupestris* (With.) Fern. & Weath., and *P. pseudo-distans* (Crép.) Jans. & Wacht.

The wool adventives at Hextable near Swanley continued to appear but only on a greatly reduced scale.

V.-c. 17, Surrey.

The Woolly-headed Thistle, *Cirsium eriophorum* (L.) Scop. var. *britannicum* (Petrak) Dr., was recorded by H. Britten from Old Coulsdon. The only other record we have for this fine plant from the London Area is that of J. E. Cooper, who found it at Crouch End, v.-c. 21, in 1896. The only previous published record for Surrey appears to be the entry for the county with a query mark in Watson's *Topographical Botany*, Edition 2.

Mr. Britten also writes that two and three plants of *Orchis purpurea* Huds. were seen in the Selsdon district in 1948, 1949, and 1950 but did not reappear in 1951. A single plant of *Silene anglica* L. was seen on Barnes Common on the visit by the L.N.H.S. Botanical Section. Miss B. M. C. Morgan sent a specimen of ×*Senecio londinensis* Lousley (the hybrid between *S. squalidus* L. and *S. viscosus* L.) from near Pendell Court, Bletchingley. F. Rose and R. A. Boniface report a few plants of *Anagallis tenella* L.—the Bog Pimpernel—from a bog on Oxshott Common. Mr. Boniface observed several plants of *Chenopodium hybridum* L. in Wandsworth Park. He also records *Carex laevigata* Sm. from a swampy wood on the golf course, Wimbledon Common.

The occurrence of *Helleborus viridis* L. var. *occidentalis* R. & F. in Fridley Copse, Mickleham, was first published in 1837, but the copse is now in private grounds, and the record has not been confirmed recently. J. E. S. Dallas saw it there on April 21st—the locality is just outside the boundary of our Area. Corncockle, *Agrostemma Githago* L., is now very seldom seen: J. D. Lovis found it in July in two cornfields between Riddlesdown and Hamsey Green.

V.-c. 18, South Essex.

In September, Lt.-Col. J. Codrington took me to see an umbellifer he had found in a small salt marsh at Creekmouth, Barking. This proved to be *Oenanthe Lachenalii* C. Gmel., previously included in our records only from the other side of the Thames. It grew with *Aster Tripolium* L., *Glaux maritima* L., *Cochlearia anglica* L., *Apium graveolens* L. and other maritime species in an abundance which was particularly pleasing so near London.

On the way we visited a rubbish dump near East Ham which produced *Xanthium Strumarium* L. On a later visit to the same dump with Mrs. B. Welch, Mrs. B. H. S. Russell and Miss W. Frost we found several plants of Yellow Sea-Poppy, *Glaucium flavum* Crantz, and the dock, *Rumex palustris* Sm. We also found a number of interesting aliens including *Dracocephalum parviflorum* Nuttall and *Phleum subulatum* (Savi) A. & Gr. (det. Dr. A. Melderis). Lt.-Col. Codrington collected *Eragrostis cilianensis* (All.) Lutari there a few days earlier.

R. M. Payne reports *Dryopteris Borreri* Newman from Epping Forest as a single plant—records of this segregate of the Male Fern will be welcome from all parts of the Area. D. H. Kent observed *Epilobium adenocaulon* Hausskn. from a railway yard at Snaresbrook. In December, F. Rose visited the bog near the Wake Arms and confirmed the continued existence of several species already in our records. He informs me that *Drosera anglica* Huds., *Andromeda Polifolia* L., and *Lycopodium inundatum* L. have been planted there recently.

V.-c. 21, Middlesex.

Attention has already been drawn in these notes to the potentialities of railway premises as habitats for interesting plants. Early in 1951 Dr. J. G. Dony, in tracing south the distribution of species found on railway tracks on the Midland Region system in Bedfordshire, made two important records for our Area. He found *Cerastium tetrandrum* Curt. and *Cochlearia danica* L. near Mill Hill. D. H. Kent has investigated railway tracks in other parts of the county, and between Denham and Uxbridge he got *Arenaria tenuifolia* L. and *Nardurus maritima* (L.) Janchen (det. C. E. Hubbard), while between Poyle and Yeoveney he discovered a fine well-established patch of *Falcaria vulgaris*.

Bombed sites have produced some unexpected plants. On one, not far from Victoria Station, *Centaurea Calcitrapa* L. was found by D. McClintock and independently by Lt.-Col. J. Codrington—one of the plants disappeared early in the summer, but the other continued in flower well into the autumn. Near Tower Hill Station, W. N. Lawfield found *Cochlearia officinalis* L. in June. Mrs. L. M. P. Small sent me a specimen of *Rumex trigranulivalvis* (Danser) Rech. fil. from a bombed site near Shadwell, and when I visited the place later I saw about a dozen fine large plants of this North American Dock. Miss M. Sayle collected *Iva microcephala* Nutt. from a field border at Harefield in 1950, which has been identified by Mr. Kent this year.

The wet season encouraged a luxuriant growth of aliens on the rubbish dumps of Middlesex. *Guizotia abyssinica* Cass., which used to be plentiful before the war, reappeared this year in some quantity on Hanwell, Harefield, and Hounslow Heath tips. On the same day, D.

H. Kent, myself and D. McClintock saw a single plant of *Salvia reflexa* Hornem. at Hanwell dump—this appears to be only the fourth record for Britain. R. W. David found *Hordeum jubatum* L. at a rubbish tip at Lower Feltham.

The position regarding records from North and South Essex has improved a little during the year—mainly due to help from R. M. Payne and B. T. Ward—but these vice-counties still require further observations to bring them up to the standard of Kent, Surrey and Middlesex. The small portions of Buckinghamshire and Hertfordshire within our Area remain in need of much more attention.

We are indebted to the following for their contributions of records during the year:—E. B. Bangerter, R. A. Boniface, H. Britten, K. E. Bull (per J. E. L.), Lt.-Col. J. Codrington, T. G. Collett (per D. H. K.), J. E. S. Dallas, R. W. David, Dr. J. G. Dony, Mrs. D. M. Eastwood (per D. H. K.), Miss W. Frost, R. A. Graham, P. Greenfield, D. H. Kent, W. N. Lawfield, J. D. Lovis, D. McClintock, E. Milne-Redhead, Miss B. M. C. Morgan, R. M. Payne, H. M. Pratt, F. Rose, Mrs. B. H. S. Russell, Miss M. Sayle (per D. H. K.), Mrs. L. M. P. Small, W. H. Spreadbury, B. T. Ward, Mrs. B. Welch, I. A. Williams, and P. F. Yeo. I should also like to express my appreciation of Mr. D. H. Kent's constant collaboration throughout the year.

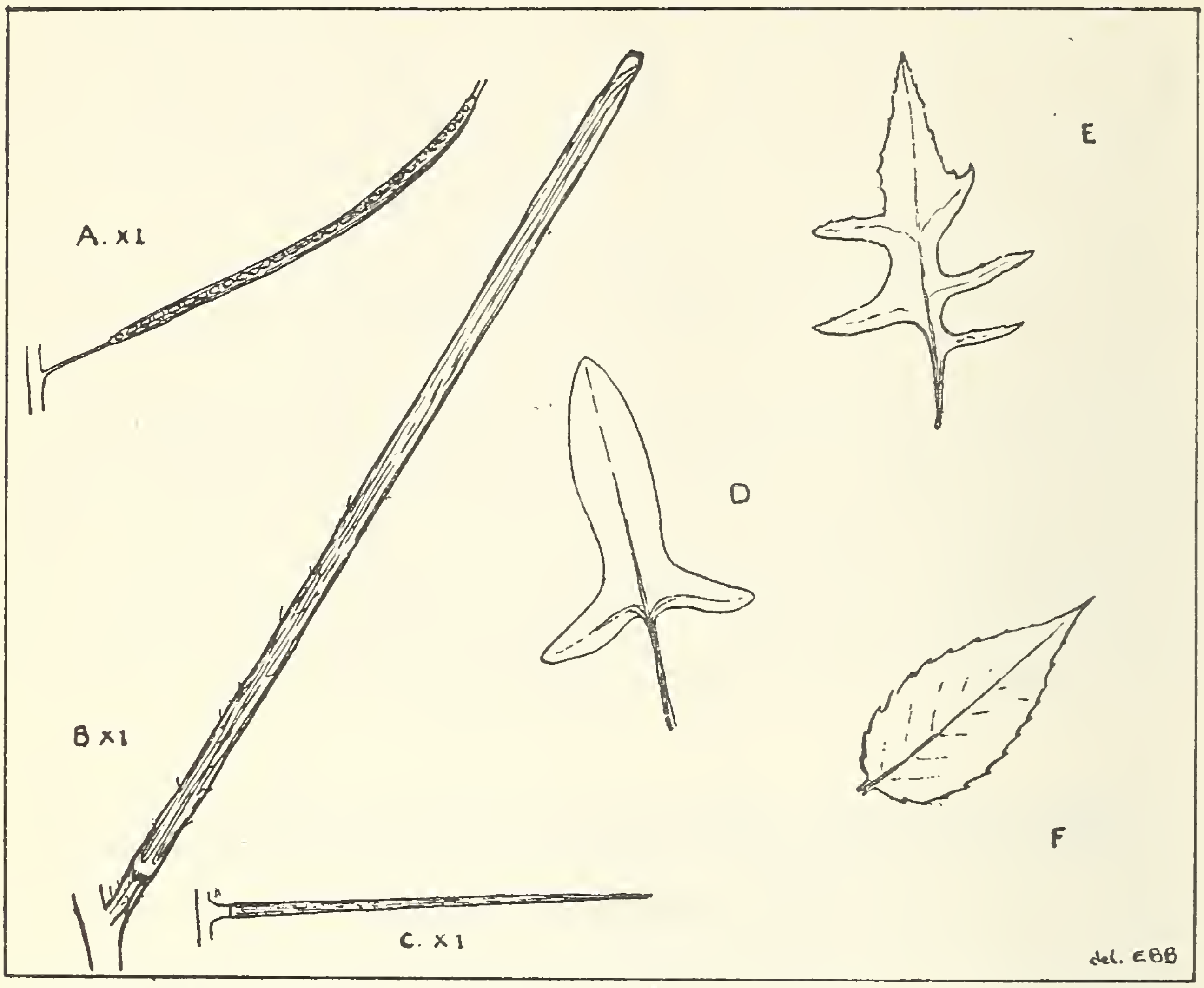
The London Rocket and its Allies of the London Area.

By E. B. Bangerter and B. Welch.

So named because of its dramatic association with the Metropolis, London Rocket is a plant that never fails to rouse the interest of London botanists. The true *Sisymbrium Irio* is very rare; the yellow-flowered *Cruciferae** that are often confused with it are more wide-spread. To make easier the task of distinguishing the various species of the genus *Sisymbrium* which are recorded for the London area by Kent and Lousley in their "Hand List" (Supplement, *London Naturalist*, No. 30), a series of simple descriptions has been drawn up, and it is hoped that interest in the alien species will be stimulated, so that more of them will be recorded.

As a guide to the descriptions, a key to the less-known species is given. Common Hedge-Mustard, *Sisymbrium officinale*, Thale-Cress, *Arabidopsis Thaliana* (*Sisymbrium Thalianum*), and Jack-by-the-Hedge, *Alliaria petiolata* (*Sisymbrium Alliaria*) are omitted from the key, the last two being sufficiently distinct to be placed by modern authors in separate genera; they are both white-flowered. Flixweed, *Descurainia* (*Sisymbrium*) *Sophia* is included in the key as it has a yellow flower and has been confused with *S. Irio*. Simple terms and easily visible characters have been used in the key, as it is intended for the amateur botanist. It should be used with mature specimens and always in conjunction with the descriptions which follow it.

**Cruciferae*, the family to which the genus *Sisymbrium* belongs is so named from the cross-like arrangement of the four petals.



A, Beaded pods of *S. Irio*. B, Ridged pods of *S. orientale*. C, Awl-shaped pods of *S. erysimoides*. D-F, Diagrammatic, not to scale. D, Hastate leaf of *S. orientale*. E, Simply divided leaf of *S. Irio*. F, Undivided leaf of *S. strictissimum*.

KEY.

FLOWERS YELLOW.

Leaves undivided, edge entire or toothed .... *strictissimum* 5

Leaves varying between finely divided and broadly lobed:

Pods more than 2″ long; as thick as their stalks:

All leaves divided; uppermost leaves with narrowest segments......... *altissimum* 7

Uppermost leaves entire or with two nearly horizontal lobes (hastate), middle hastate or with hastate terminal lobe........... *orientale* 8

Pods less than 2″ long:

[Stalks of pods thickened at top and strongly curved..................... *pyrenaicum* 11]

Stalks distinctly thinner than the pods:

All leaves very finely divided (2-3 times pinnatifid)......*Sophia* 6

All leaves simply divided:

Flowers small, about $\frac{1}{8}''$ across; stem almost or quite without hairs ....*Irio* 10

Flowers larger, about ¼″ across; stem with many long stiff hairs *Loeselii* 9

FLOWERS WHITE.

Leaves divided (pinnatifid); pods awl-shaped.................*erysimoides* 3

DESCRIPTION OF SPECIES (arranged in the order most convenient for identification).

1. *Arabidopsis Thaliana* (Thale-cress). A slender white-petalled branching annual, flowering usually in the spring. It is recognised by its rosette of stiff-haired, slightly-toothed leaves and narrow pods. The hairy stem bears a few scattered leaves.

2. *Alliaria petiolata* (Jack-by-the-hedge). This very common, tall, coarse, white-petalled plant is also early-flowering. It has many broad leaves, the lower characteristically long-stalked. It is sometimes called Garlic Mustard as the leaves, when rubbed, emit a smell of garlic.

3. *Sisymbrium erysimoides.* The third white-flowered species is a rare alien from the western Mediterranean. It is a stoutish glabrous, early-flowering annual, with almost horizontal pods which taper from the base and, unlike 1 and 2, it has divided leaves.

4. *Sisymbrium officinale* (Common Hedge-Mustard). Frequently seen throughout the summer in hedgerows and on roadsides, this tall, stiff, yellow-flowered, slightly hairy plant is annual or biennial. The pods are closely adpressed to the long central stem and upward-curving side branches, which may have the appearance of a candelabrum. The variety *leiocarpum* is recognised by its brighter green, more shining foliage and shining glabrous pods.

5. *Sisymbrium strictissimum.* A coarse, leafy perennial, flowering June to August. It is the only yellow-flowered *Sisymbrium* with undivided leaves so far reported in our area. An alien from Central Europe, it is recorded from situations where it might have been introduced with garden plants. Its cylindrical pods, 1½″-2″ long, are numerous and crowded.

6. *Descurainia Sophia* (Flixweed). A leafy, erect annual, flowering from June to August, with pale yellow petals shorter than their sepals. The finely-divided leaves which characterise it are usually covered with short, soft, forked hairs. The fruiting stems, bearing many slender pods ¾″-1″ long, elongate up to a foot or more, the pods tending to curve inwards. It occurs in our area as an alien on rubbish tips and waste ground.

7. *Sisymbrium altissimum* (Tumbling-Mustard). An erect, usually much-branched, annual alien, commonly found on waste ground, flowering throughout the summer. The petals are yellow, double the length of the spreading sepals. The very long stiffly-spreading pods are more or less in a straight line with their stalks. All the leaves are divided, the lowest having the broadest segments and the uppermost being characteristically pinnate with linear segments.

8. *Sisymbrium orientale.* An erect branching annual alien, flowering throughout the summer, locally abundant on waste ground. The

petals are brighter yellow and smaller than in 7, and the sepals more erect. The pods are like those of 7, but sometimes have a few stiff hairs. The uppermost leaves are entire and narrow; the lowest are coarsely divided; the middle leaves are distinctive, being hastate or with a hastate terminal lobe.

9. *Sisymbrium Loeselii.* An erect annual of European origin, flowering from June to late summer in similar situations to 10, but much more widespread. Its distinguishing features are the long stiff hairs which clothe the stem and branches, and the uniformity of leaf-shape throughout the plant, the lobes being sharply triangular. The fruiting stem has somewhat the appearance of that of 6, the pods having the same "beaded" appearance, unlike the ridged pods of 7 and 8. The bright yellow petals are larger than those of 10.

10. *Sisymbrium Irio* (London Rocket). In its range across Europe, western Asia and north Africa, this is a variable species, particularly in leaf form and hairiness. In the London Area it seems to be an almost hairless plant with irregularly lobed leaves. It is a branching annual, flowering from June to September, usually not so tall as, and with smaller flowers than 7, 8 and 9, the species with which it is most commonly confused. It also differs from 7 and 8 in having "beaded" (not ridged), shorter and more slender pods, and from 9 in being glabrous, or with a few shorter less stiff hairs, and in having longer, more flexuous pods, which give the plant a somewhat "untidy" appearance. It is distinguished from *D. Sophia* mainly by the shape of its leaves, but also by the pale yellow petals, those of *S. Irio* being longer than the sepals, whereas those of *D. Sophia* are shorter than the sepals. Only in *S. Irio* do the young pods over-top the flowers.

This plant has a long history in the London Area, being first mentioned in print in 1666 by Merrett, as already "almost everywhere in the suburbs". In 1667 and 1668 it was very abundant on the ruins round St. Paul's after the Great Fire of 1666, and it was mentioned particularly as occurring between the City and Kensington (Ray, *Cat.*, 1670). It was growing copiously at Chelsea in 1680, 1695 and about 1790. In 1709 it was recorded between Brick Lane (Shoreditch) and Islington, and in 1760 at the end of Goswell Street, Islington. In 1777 Curtis described it as "frequent enough about London", and in the British Museum there are specimens collected from Shoreditch and Haggerston (E.8) before 1805, and from Barking, 1822. It was recorded at Brompton by W. Borrer and in 1832 between Earl's Court and Walham Green by W. Pamplin. From 1945 to the present day, it has been known as a very rare plant in a small area to the east of the City of London.

11. *Sisymbrium pyrenaicum.* We have examined the plant cited as this in the "Hand List"; it is *S. Loeselii.* So far we have not seen any specimens of *S. pyrenaicum* from the London Area. It is a perennial alien, with divided leaves and rather large yellow flowers. The stalks of the pods are thickened at the top and curve so strongly that the mature pods become tightly interlaced.

Should the key and descriptions prove inadequate, specimens which should show leaves, flowers and fruit, may be sent for identification to the Department of Botany, British Museum (Natural History), South Kensington (by kind permission of the Keeper of Botany). Records, which should be accompanied by voucher specimens unless the plant is extremely rare, will also be gladly received.

The nomenclature adopted is that of Kent and Lousley, *op. cit.*, where details of distribution are given No exhaustive bibliography is appended, but the following will be found useful, and those marked "L" are in the L.N.H.S. Library.

Babington, C. C., *Manual of British Botany*, 10th Edition, 1922, edited by A. J. Wilmott. Appendix II.

L Butcher, R. W., & Strudwick, F. E., *Further Illustrations of British Plants*, 1930.

L Ross-Craig, S., *Drawings of British Plants*, Part III, 1949.

L Clapham, A. R., Tutin, T. G., & Warburg, E. F., *Flora of the British Isles*, 1952.

(Attention is drawn to the transposition of the leaves of *Sisymbrium Irio* and *S. orientale* in Fig. 23 in this *Flora*. Professor Clapham has confirmed this in a letter.)

L Coste, H., *Flore de la France*, 1901.

Hegi, G., *Illustrierte Flora von Mittel-Europa*, Vol. IV, 1916.

Finally we wish to acknowledge our indebtedness to Dr. A. Melderis of the British Museum (Natural History), for his invaluable assistance in the preparation of the key and descriptions, and to Mr. D. H. Kent for reading the manuscript and for many useful suggestions.

The Present Flora of Barnes Common, Surrey

By Mrs. Margaret Whitehouse.

BARNES Common is the last little piece of open Surrey country on the way into London, and although only five miles from Piccadilly Circus, it still retains some of the characteristics of a Surrey heath on its sand and gravel soil. Although so limited in size (123 acres), cut up by two main roads and by the railway, visited by hordes of merciless flower-pickers in the form of children and trippers, ravaged by frequent fires and suffering from having much of its area dug up or overlaid and converted into playing fields, allotments and rubbish-dumps, Barnes Common is still the home of a surprising number of interesting plants, most of which have long been established there.

In 1882 Paley wrote rather gloomily:—"The beautiful needle-whin (*Genista anglica*), the yellow broom, the fragrant wild hyacinth, the creeping willow with its cottony catkins, and the delicate *Rosa spinosissima* are yet fairly abundant, though I fear that, with the heather (*Calluna vulgaris*), their existence is doomed." To-day, all these plants are still to be found, though it is true that the bluebells are no longer abundant and the heather has been reduced to three or four small plants. The chief change seems to be that the Common is so much drier now. Paley mentions " a good many small ponds, streamlets, springs, and boggy places," and lists numerous water-plants; but to-day we have only one small pond, and a short stretch of Beverley Brook as a boundary, with its bank dug up for allotments. No really boggy land remains and among the last survivors of the long list of damp-loving plants which flourished seventy years ago are *Polygonum amphibium*, *Lycopus europaeus* and *Gnaphalium uliginosum*. The last plant is apparently confined to a bomb-crater in a formerly marshy area, and it would be interesting to know if its presence here is due to the germination of old seeds disturbed by the bomb and favoured by the moisture which has collected in the crater. A few spikes of Purple Loosestrife (*Lythrum salicaria*) remained in 1946 and one plant of Bur-Marigold (*Bidens cernua*) in 1947, but both have since disappeared. There are some fine trees of *Salix fragilis* beside the Brook and a flourishing colony of *S. purpurea*. Two Alder trees only are left, of which one is dying.

It is difficult to be sure which trees are indigenous and which have been planted, but the most typical of the Common are Birch (*Betula pendula*) and Oak (*Quercus robur*) and no doubt these are truly wild. One or two bushes of *Salix atrocinerea* and Hazel (*Corylus avellana*) are probably survivors from the original tree-population, most other species being doubtfully wild. Bushes of Gorse (*Ulex europaeus*), Broom (*Sarothamnus scoparius*) and various Brambles are abundant, and are holding their own well in spite of the ravages of fire and of pickers, and the Creeping Willow (*Salix repens*) still occurs fairly freely. The thriving patches of Burnet Rose (*Rosa spinosissima*) are among the greatest treasures of Barnes Common, and they are known to have been there for at least three hundred years. Two bushes of the rare hybrid *Rosa glabra* W.-Dod survive and flower well, but rarely ripen fruit.

Some of the most typical plants, well distributed over the whole area, are:—Sandspurrey (*Spergularia rubra*), Harebell (*Campanula rotundifolia*), though decreasing notably during the last twenty years, Heath Bedstraw (*Galium saxatile*) and Ladies' Bedstraw (*G. verum*), Tormentil (*Potentilla erecta*), Buck's Horn Plantain (*Plantago coronopus*), Sheep's Sorrel (*Rumex acetosella*), Bracken (*Pteridium aquilinum*) and the tiny Bird's Foot (*Ornithopus perpusillus*), surely one of the most beautiful little plants in the British Flora. Among other plants noted by Paley, or by de Crespigny in 1877, which still exist, but in small numbers, are *Stellaria graminea*, *Geranium pyrenaicum*, *G. molle*, *Erodium cicutarium*, *Trifolium dubium*, *Vicia cracca*, *Lathyrus pratensis*, *Conopodium majus*, *Torilis anthriscus*, *Lonicera periclymenum* (one plant), *Centaurea nigra*, *Leontodon autumnalis*, *Stachys officinalis* (Betony, a single clump), *Scleranthus annuus* and *Luzula campestris*. *Geranium pyrenaicum* re-appeared in 1948 on the site of a bomb-crater or sand-pit which had been covered over with alien soil, and it is increasing; one wonders whether it was re-introduced with the new soil or is a descendant of the old plants.

New-comers which are now well-established include two forms of *Medicago falcata*, *Impatiens parviflora* and *Lactuca serriola* on dumped soil, and *Chelidonium majus* which may well be a garden escape as it includes the double form.

Carices are now scarce but *C. hirta* and *C. ovalis* occur. It seems likely that Paley may have mistaken the latter for *C. arenaria* which he recorded. There are at least 30 species of grasses on the Common. The most characteristic on the old undisturbed surface are *Agrostis tenuis* (*A. vulgaris*) and *Deschampsia flexuosa*, interspersed with *Aira praecox*. Among others which occur are *Molinia caerulea*, *Nardus stricta*, *Koeleria gracilis*, *Trisetum flavescens* and *Sieglingia* (*Triodia*) *decumbens*. In 1948 a well-established patch of *Cynodon dactylon* (Bermuda or Dog's-tooth Grass) was discovered; only once before recorded in Surrey. It is often used as a lawn-grass in hot countries and in Britain is usually confined to sandy parts of the south-west coast. It is now thriving and spreading on the sandy Common.

Some Jottings from Pepys' Diary.

By W. C. Cocksedge.

SAMUEL PEPYS was essentially a Londoner, although he is supposed to have been born at Brampton, Huntingdonshire, a district in which his forbears had been settled for generations. From his Diary, we obtain a very vivid picture of the social life of the City in the days of the Restoration and it is scarcely necessary to stress its value to the historian. As a human document—a very human document—it is unique. Such a man, incorrigibly curious and alive to every passing phase of his era, could not fail to leave something of value to the researches of future ages and his Diary is thereby ensured of immortality.

Although it covered only a brief decade, it was a momentous time in the history of the City. It opens when London largely preserved its medieval aspect, modified by the extensive building developments which gained momentum in the time of Queen Elizabeth; it closes amid a scene of ruin left by the Great Fire. Pepys lived to see but could not record the New London which rose during the closing years of the seventeenth century. A foreign visitor was surprised at the number of Kites which hovered over the City in Tudor times. By the time of the Restoration, the Kites had disappeared—at least Pepys does not mention them. They were a medieval feature which had passed away with many other vestiges of antiquity. Yet the London depicted by Pepys was a strange place. Side by side with great mental activity, an enlightened appreciation of the arts and sciences and considerable refinement in attire, we find a great deal of squalor, coarse manners verging upon brutality, dense ignorance in many quarters, credulity and an appalling amount of inconvenience which was accepted without cavil. All this is made abundantly clear by the ingenuousness and transparent honesty of the Diary.

I wished originally to write an account of Pepys in relationship to the City churches but a careful perusal of the Diary showed that, apart from his own parish church of Saint Olaves, Hart Street, where he regularly attended Divine service, his references to the one hundred odd medieval churches which were still standing within the City bounds at the time of the Great Fire are few and disappointingly vague. Still, the few slight references to churches which were swept away in the Fire and not always rebuilt are of some interest to the browsing antiquary. Saint Dionis Backchurch is mentioned casually. This church with the curious name was rebuilt by Wren, only to be pulled down in the nineteenth century. It stood at the corner of Lime Street and Fenchurch Street. He also alludes to "Fanchurch" (9 April 1665) "the little church in the middle of Fanchurch Street where a very few people and few of any rank." This was the church of Saint Gabriel, burnt in the Great Fire and not rebuilt. Altogether he seems to have entered less than a score of the City churches then existing, and then only in company with friends or to hear a particular preacher. "12 February 1665. Up and to church to Saint Lawrence (Jewry) to hear Doctor Wilkins, the great scholar, for curiosity, I having never heard him. I was also well pleased with the church, it being a very fine church." Sometimes his activities were more reprehensible. It was at Saint Dunstans, Fleet Street, on the 18 August 1667 that he stood by "a pretty, modest maid" whom he pestered with his attentions until she took pins out of her pocket to defend herself "which seeing I did forbear and was glad I did spy her design." But it was in his parish church of Saint Olave that Pepys' interests were chiefly centred and there are innumerable references to it in the Diary, many of them of a very worldly and secular nature. This was one of the medieval churches which escaped the Great Fire only to be calamitously destroyed in the late war. I always think that this church was the prototype of the church of Saint Ghastly Grim portrayed by Dickens, whose imagination was seized by the crowned Death's Head on the gateway of the churchyard and the high spiked railings designed to circumvent body-snatchers.

Despite Pepys' insatiable curiosity and his intense interest in artistic and quasi-scientific matters, he fails when regarded as an antiquarian. Not that he was without a feeling of reverence for antiquity. In his memorable journey to the West Country, he visited Avebury and writes in the Diary, "In the afternoon came to Abebury where seeing great stones like those of Stonage standing up, I stopped and took a countryman of that town and he carried me and showed me a place trenched in like Old Sarum almost, with great stones pitched in it, some bigger than those at Stonage in figure to my great admiration and he told me that the mount cast hard by is called Selbury. But about a mile off, it was prodigious to see how full the Downs are of great stones and all along the vallies, stones of considerable bigness, most of them growing certainly out of the ground so thick as to cover the ground which makes me think less of the wonder of Stonage, for hence they might undoubtedly supply themselves with stones, as well as those at Abebury." A few days previously, he had visited Stonehenge and records "to Stonage over the Plain and some great hills even to fright us. Come thither and find them as prodigious as any tales I ever heard of them and worth going this journey to see. God knows what their use was! They are hard to tell but yet may be told." This is a reference, of course, to the old tale that they cannot be counted. On the same journey Pepys naturally visited Salisbury and remarks, "The Minster most admirable, as big I think and handsomer than Westminster."

But to return to London. Pepys' vivid pen-pictures of the Great Fire and its ravages are of historical value, but are, of course, well known to most readers. He dwells particularly upon the plight of Old St. Pauls. So completely has Wren's great creation dominated our minds as well as the City, that we find difficulty in picturing to ourselves that great Gothic building rising above the comparatively low huddle of dwelling-houses, churches and buildings of all ages with more than a scattering of medieval fragments which composed the City before the Great Fire and of which only Stow in his slow, quaint, categorical manner, gives us a tentative picture. Pepys saw this city and perhaps marvelled at it but has not, unfortunately, left us his impression.

Old St. Pauls was a thing of shreds and patches, having suffered greatly from fire and restoration, but throughout the fabric it must have presented many relics of medieval work. In this connection, Pepys' entry in the Diary of 16 September 1668 is of interest: "I stopped, too, at Paul's and there did go into St. Fayths Church and also in the body of the west part of the Church and do see a hideous sight of the walls of the Church ready to fall, that I was in fear as long as I was in it, and here I saw the great vaults underneath the body of the Church. No hurt I hear is done yet, since their going to pull down the Church and steeple. It is pretty here to see how the late Church was but a case wrought over the old Church; for you may see the very old pillars standing whole within the wall of this."

Perhaps the Diary may be consulted with most profit for its references to old customs. It is amusing to read of Mrs. Pepys and her maids visiting the nearby country to gather May-dew, presumably for the complexion.

"May 28, 1667. My wife away down to Woolwich in order to a little ayre and to lie there to-night and so to gather May-dew to-morrow morning which Mrs. Turner hath taught her as the only thing in the world to wash her face with; and I am contented with it.

10 May 1669. Troubled about three in the morning with my wife's calling her maid up and rising herself, to go with her coach abroad, to gather May-dew."

And again "11 May 1669. My wife again up by four o'clock to go to gather May-dew."

There are casual references to other May-day customs.

"1st May 1667. Thence to Westminster, in the way meeting many milkmaids with their garlands upon their pails, dancing with a fiddler before them."

The mention of gipsies is interesting. On 22 August 1663, Pepys met one of them while walking to Greenwich and was persuaded to have his fortune told, for which he rewarded her with ninepence. She bade him beware of a John and a Thomas and told him that somebody would shortly be with him to borrow money. A few days later, he records that his brother John had brought a letter from his brother Tom, requesting the loan of £20, which is certainly remarkable if we can give it credence.

On the 11 August 1668 there is this entry, "This afternoon, my wife and Mercer and Deb. went with Pelling to see the gipsies at Lambeth and have their fortunes told; but what they did, I did not enquire." It has been confidently assumed that their jaunt took them to the Great North Wood, which was in the parish, and one imaginative writer suggests that they might have met, as a young girl, the famous Margaret Finch, the "Queen of the Gipsies," who was buried at Beckenham in 1760 at the reputed age of 109 years. Be this as it may, it is hardly likely that they ventured so far from home.

A feature of great interest in the Diary is the many references to the custom of choosing Valentines on 14 February, a custom which some of us may remember in its nonage.

7 March 1663. "The (Theophila) Turner dined with me and, after dinner, I took coach and carried her home, in our way in Cheapside, lighting and giving her a dozen pairs of white gloves as my Valentine."

14 February 1665. "This morning comes betimes, Dicke Pen to be my wife's Valentine and come to our bedside. I up about business and opening the door, there was Bagwell's wife and she had the confidence to say she came with a hope to be (in) time to be my Valentine and so indeed she did." (Bagwell was a carpenter, and our old friend might appear to be snobbish; but attentive readers of the Diary will know that he had come to be sensitive about Mrs. Bagwell.)

15 February 1666. "And by and by comes Mrs. Pierce with my name in her bosom for her Valentine which will cost me money."

10 March 1666. "I carried them and my wife out by coach to the New Exchange and there I did give my Valentine, Mrs. Pierce, a dozen pair of gloves."

14 February 1667. "This morning came up to my wife's bedside, little Will. Mercer to be her Valentine and brought her name writ. upon blue paper in gold letters, done by himself, very pretty. But I am also, this year, my wife's Valentine, and it will cost me £5, but that I must have laid out if we had not been Valentines."

15 February 1669. "Thence to my cozen Turner's where having the last night been told by her that she had drawn me for her Valentine, I did this day call at the New Exchange and bought her a pair of green silk stockings and garters and shoe strings and two pair of jessimy gloves, all coming to about 28s."

From one or two casual references, it would seem that Valentines were customary at the profligate Court of Charles II when the presents were, naturally, costly jewels. It would also seem that the gentleman was expected to pay some slight attentions to his Valentine throughout the ensuing year.

Under date 1 March 1667, we read " In Mark Lane, I do observe, it being S. David's Day, the picture of a man dressed like a Welchman, hanging by the neck upon one of the poles that stand out at the top of one of the merchant's houses, in full proportion and very handsomely done; which is one of the oddest sights which I have seen a good while, for it was so like a man that one would have thought that it was indeed a man."

This curious reference seems to have excited little attention amongst antiquaries. In a note to my edition of the Diary (G. Bell & Sons, Ltd., 1928) it is stated that Mr. W. C. Hazlitt in his edition of Brand's *Popular Antiquities* writes: " The practice to which Pepys refers was very common at one time and till very lately, bakers made gingerbread Welshmen, called " taffies " on S. David's day which were made to represent a man skewered." From Pepys' obvious surprise, it is fairly evident that the practice was not very common in his day, otherwise it would probably not have been mentioned. This must be kept much in mind when seeking evidence for the origin and continuance of archaic customs. My old friend, Mr Walter Johnson, who wrote exhaustively upon the subject of ox-labour in England, used to insist that it was formerly so universal in this country, that it excited no special notice. It was only when it was becoming obsolete that particular attention was drawn to it. Cobbett refers to the subject now and then in his " Rural Rides," because at that time it was somewhat unusual, but on the other hand I am not aware that there is a single reference to it in Pepys' Diary. In any case, it must be admitted that Pepys has little to say about rural scenes and activities, although, like most men ' long in city pent,' he appreciated a breath of fresh air.

After his day-dreams of a coach of his own were realised, he made frequent little jaunts into the rural suburbs, where he partook of refreshment with his wife and friends. It is interesting to note that these excursions were, in his case, for convenience probably, usually on the North and East sides of the City and were not far extended. Often the spots are not particularly salubrious or retired at the present day.

On April 23, 1665, we read: " Then after dinner, we and Creed by coach took the air in the fields beyond St. Pancras," an inexpensive outing which would scarcely be feasible at the present time. With similar intent we read of jaunts to " Mile -end Greene," where he ate some cream and cakes, to Islington where, after a walk in the fields, he took his companions to the ' great cheese-cake house,' and entertained them, and again, " anon, with my wife by coach to take the ayre, it being a noble day, as far as the Greene Man (probably on Stroud Green) mightily pleased with our journey and our condition of doing it in our own coach and so home."

But although to follow the diarist in his suburban junketings and to record what he had to eat and drink, would be an absorbing labour and of the greatest value to topographers and students of social manners, it would lead me too far afield. Feeding, by the way, would seem to have been an haphazard business in Pepys' time, and I am always struck by its casualness. There are innumerable references to meals of a sort at countless taverns and coffee-houses, nearly all run to earth by industrious topographers. Occasionally, the antiquarian note is struck. 25 September 1660: " and afterwards, I did send for a cup of tee (a China drink) of which I never had drunk before." Again, 28 June 1667 " find my wife making of tea, a drink which Mr. Pelling, the Potticary, tells her is good for her cold."

His longer excursions into the country were usually made on horseback, although coaches then got as far as some of the principal provincial towns. That is another circumstance which we often overlook. In those days every man of any consequence was necessarily a rider, although, perchance, a poor one. Even Mrs. Pepys, who was presumably a delicate and possibly a timid young woman, had sometimes to take to horseback.

When they journeyed to Cambridge, he enters in the Diary (17 September 1661) " and the next morning got up telling my wife of my journey and she got me to hire her a horse to go along with me. So I did borrow a very fine side-saddle for my wife and she and I took coach to the end of the town towards Kingsland and then got upon my horse and she upon her pretty mare that I hired for her and she rides very well. By the mare at one time falling, she got a fall but no harm; so we got to Ware. The next morning up early and begun our march, the way about Puckridge very bad and my wife in the very last dirty place of all, got a fall, but no hurt though some dirt."

It must be remembered that in the days of Pepys the whole countryside was unenclosed and but poorly cultivated, and roads were little better than tracks across the open plains. In bad weather, these tracks became very confused through horsemen galloping about to find a cleaner way. Pepys records that he lost his way near Royston when returning from Cambridge.

In conclusion, I would quote old Reyce who wrote the Breviary of Suffolk:—" And indeed what is more commendable in my weak judgment, than curiously to search out the best ornaments of his native soil—yea, what can be more pleasing to the judicious understanding than plainly to see before him, the lively usuage of elder times, the alteration of names clean worn out, the revolution of families now wholly extinguished, the traces of antiquity, the memorials of our honorable ancestors with the monuments of their best deservings, exciting us to imitation and the notes of their frail blemishes, admonishing us to eschew them."

How peculiarly appropriate to Pepys and his Diary!

The Flies of the London Area.

I. Conopidae.

By L. Parmenter, F.R.E.S.

ALL animals have their niches in nature. Their importance in a fauna depends on their habits, their numbers and their distribution. To aid in the assessment of the importance, to help the conservator to maintain a proper balance of wild life and to assist the student to find the animals for his studies, some account of the distribution is needed at an early stage. The provision of a distribution list for all the flies of our London Area, i.e. within a 20-mile radius from St. Paul's Cathedral, would exhaust the patience of our Editors. The task has been tackled so far by papers dealing with small areas.

With the publication of a well-illustrated and excellent introductory book on the " Flies of the British Isles " by our member, Mr. C. N. Colyer, in collaboration with the artist, Mr. C. O. Hammond, and the steady production of adequate keys to species by the Royal Entomological Society and others, more naturalists will be paying attention to flies (Diptera).

The study of the distribution of these insects in our area may now be undertaken to enable as many as possible to participate. It is proposed to publish a synopsis of our present knowledge of a family or two at a time. The first selected is a small one of 18 or so species in this country belonging to 8 genera.

In the grub stage these Conopid flies are internal parasites of bees and wasps. As adults they feed on the nectar of various flowers and have been seen leaving the flowers to attack bees in flight to lay their eggs on them. As mimics of Hymenoptera they interest biologists and invite the attention of ornithologists as to their protection from the attacks of birds. Except where stated the records of visits to the flowers mentioned are all from the London Area. Other life-history details include continental studies.

The appended list does not pretend to represent the complete distribution of the species in our area—it is merely a statement of our present knowledge showing the tremendous gaps, and therefore an invitation to further study.

Specimens of the commoner species have been placed in the Society's collection and these with Mr. Hammond's coloured figures and Mr. K. G. V. Smith's key to the family should enable the flies of the family to be recognised in the field. Observers are invited to send me details of occurrence and habitat, estimates of numbers, flowers visited, and interrelations with Hymenoptera and other animals.

Thanks are tendered to the following who have already assisted with records and/or specimens from the London Area and other localities in Britain:—Dr. C. H. Andrewes, F.R.S.; Messrs. H. W. Andrews, H. J. Burkill, B. L. J. Byerley, C. L. Collenette, C. N. Colyer, P. W. E. Currie, E. C. M. d'A. Fonseca, K. M. Guichard, C. O. Hammond, F. J.

Hatcher, E. E. Syms, W. H. T. Tams, H. J. Turner, B. T. Ward, R. D. Weal and Dr. I. H. H. Yarrow.

Vice-counties are shown as:—K.16 = Kent West; S.17 = Surrey; E2.18 = Essex South; H.20 = Hertfordshire; M.21 = Middlesex.

No records are available for E1.19 = Essex North and B.24 = Buckinghamshire.

The localities are mentioned in alphabetical order of counties with each vice-county separated by a semi-colon.

CONOPINAE.

Conops vesicularis L.

Not yet recorded from our area, but I have found it in Surrey and Sussex, just outside our circumference, and have seen specimens from Dorset and Hants.

Flies in May and June. Has visited *Crataegus* sp. and *Berberis* flowers. Stated to parasitize *Bombus muscorum* L.

Conops quadrifasciata Deg. S.17, E2.18, H.20, M.21.

It still occurs at Chingford and Wimbledon and further out. It has been found in Epping Forest; Aldenham, Batchworth Heath, Bayford, Brickett wood, Harrocks wood (near Watford) and Northaw; Hadley wood, Trent Park, Edgware and Ruislip; Ashtead, Bookham common, Limpsfield common, and Wimbledon common.

Outside our area I have seen specimens from Bucks, Devon, Skye and Sussex.

Flight time extends from 17th July to 4th September. Has visited flowers of Bramble, *Rubus* sp. and Ragwort, *Senecio jacobaea* L. Stated to parasitize *Bombus lapidarius* L.

Conops strigata Wied.

No records from our area. I have seen specimens from Devon and Hants. taken in August and September.

Conops flavipes L. S.17, H.20, M.21.

Curiously the only specimen from the southern half of our area that I have seen is one taken at Bookham in July 1917 by Mr. E. E. Syms. In Herts. it occurs at Batchworth Heath, near Crews Hill, Harrocks wood, Northaw, Wormley and at Trent Park, Finchley and Highgate in Middlesex.

Outside the area I have seen specimens from Bucks., Devon, Hants., Kent, Wilts.

Flight time based on these 'London' records is 20th July to 27th August, but elsewhere it has lasted on into September. Has visited flowers of Bramble, *Rubus* sp., Hogweed, *Heracleum sphondylium* L. and thistles, *Cirsium* sp. Stated to parasitize *Bombus lapidarius* L. and *B. terrestris* L. and *Osmia* sp.

Leopoldius signatus Wied.

Not recorded at present from our area. It has occurred on ivy, *Hedera helix* L. blossom on which I captured a specimen on 12th October 1939 at Helston, Cornwall (*Ent. mon. Mag.*, *76*: 52). B. Verdcourt found it on the same flower at Boxmoor, Herts., on 30th September, 1946 (*Ent. mon. Mag.*, *82*: 305) and E. C. M. d'A. Fonseca (*in Litt.*) reports four from ivy blossoms on 30th September 1951, at Bristol, Glos.

Leopoldius brevirostris Germar.

No London area records.

Conopilla ceriaeformis Mg. K.16.

Although I have seen specimens from Essex as well as Hants. from outside our area, all the records for the London N.H. Society area at present come from Kent. I found it at Stone marshes on 7th September 1947. Mr. H. W. Andrews has taken it over a long period from various localities between 8th August and 16th September—Chislehurst, Darenth, Farningham, Joyden's wood, Bexley, and Pauls Gray, and Mr. E. J. Bunnett found it at Petts wood on 23rd September 1929.

Physocephala nigra Deg.

This appears to be a southern insect known chiefly from Studland Heath and other localities in Dorset. Mr. E. E. Syms has kindly let me examine a specimen labelled " New Forest, Hants., 10th July 1922, G. E. Frisby."

Psysocephala rufipes F. S.17, E2.18, H.20, M.21.

This widely distributed species has been captured at Chingford and Loughton, Epping Forest; Batchworth heath, Brickett wood, and Northaw; Hanwell, where it was taken on 24th July 1902 by the late Henry J. Turner, Hampstead Heath, Stanmore, and in Trent Park; Alderstead heath, Bookham common, and Oxshott heath.

Outside our area I have seen specimens from Cornwall, Devon, Hants., Kent, and Sussex.

It has been found between 10th July and 29th August and visiting flowers of water mint, *Mentha aquatica* L., and hedge parsley, *Torilis japonica* (Houtt.) DC. The known hosts include *Bombus agrorum* F., *B. hortorum* L., *B. lapidarius* L. and *B. terrestris* L.

MYOPINAE.

Zodion cinereum F.

No London records. Mr. C. N. Colyer has found it visiting buttercup, *Ranunculus* sp. flowers in Hants. in June and in Holland has found it on candytuft, *Iberis* sp. flowers. I have also seen specimens from Dorset. A recorded host is *Halictus rubicundus* Christ.

Zodion notatum Mg.

No London records. Mr. H. W. Andrews (*in litt.*, 14.xii.50) reported taking this species at Swanage, Dorset and at Breamore, Hants., in June. It is not mentioned in the *Check List of British Insects* of G. S. Kloet and W. D. Hincks and I understand that Mr. J. E. Collin believes that it may prove to be a dark form of *cinereum*.

The genus is stated to be parasitic on *Odynerus* and *Halictus* sp.

Thecophora atra F.

I have no London area records but have taken it only just outside at Ranmore Common, Surrey, on 30th May 1938.

Mr. H. W. Andrews reports it as widespread and common from north Kent, Dorset, Hants., and Pembs.

Thecophora sundewalli Zett.

This is also not mentioned in the *Check List* of Kloet and Hincks, but Mr. H. W. Andrews has taken it in south Ireland in August but says that Mr. J. E. Collin regards it as a variety of *T. atra.*

Thecophora pusilla Mg. S.17.

Mr. P. W. E. Currie caught this at Bookham Common, Surrey, on 3rd October 1948, on a hawkweed, *Hieracium* sp., and at Mickleham, Surrey, on 17th June 1951.

Here again we have a variable species, possibly another form of *T. atra.* The genus appears to need further attention.

The flies have been noted about the nests of *Halictus.* If some bred material could be obtained from a number of localities we might be able to make some progress in solving the problem.

Sicus ferrugineus L. K.16, S.17, H.20, M.21.

This is widely distributed and occurs at least as near to the City as Scout Park, New Southgate. Other localities known are Batchworth heath, Bayford, Brickett wood, Harrocks wood, Northaw; Charing; Edgware; Bookham common, Boxhill, Headley, Limpsfield common, Oxshott and Wisley.

The flight time extends from 22nd June to 15th August in our area. Outside I have seen specimens from Cornwall, Hants., Norfolk, Pembs., Shropshire, and up to 26th August. Chiefly seen visiting bramble, *Rubus* sp. flowers, it has also been noted at hawkweed, *Hieracium* sp. flowers.

Myopa buccata L. S.17.

There may be two species involved here, for my short series of specimens can be sorted into two distinct sizes, but I have found no constant characters to differentiate between the two forms other than size.

Form A. 5-7 mm. in length, 4 ♂♂, 1 ♀, taken at Boxhill, Surrey, on 1st June, 1941, on the leaves of the Whitebeam, *Sorbus aria* (L.) Crantz., and 1 ♀ on 30th May 1948, at Ranmore Common, Surrey, just south of our area.

Form B. 9-12 mm. in length, 1 ♀ taken at Bookham Common, Surrey, on 9th June 1935, at hawthorn, *Crataegus* sp. flowers, and 1 ♀ at Limpsfield Common, Surrey, on 20th May 1939, on a nettle leaf.

I have also taken a pair at Burley, New Forest, Hants., on 5th June 1938.

Myopa testacea L. S.17, H.20, M.21.

Although it probably occurs in each of our vice-counties, at present it is known only from Bayford and Northaw; Mill Hill, Scout Park, New Southgate and Trent Park; and Bookham Common.

Its dates run from 20th April to 16th June and it has been found visiting flowers of dandelion, *Taraxacum* sp., and hawthorn, *Crataegus* sp.

I have seen it from S. Essex, and Mr. H. W. Andrews reported it from north Kent and Hants., visiting flowers of wild garlic, *Allium* sp.

Myopa polystigma Rond. S.17, M.21.

In our area it has been taken at Scout Park, Finchley, Hampstead, New Southgate, Highgate, and Trent Park in the north and at Coulsdon and Mitcham Common in the south.

The dates are 18th April to 22nd May. Sallow, *Salix* sp. blossom, and dandelion, *Taraxacum* sp. flowers have been visited in our area. Outside, in Hants., it has visited wild garlic, *Allium* sp. I have also seen it from Herts., and Mr. H. W. Andrews reports it from north Kent.

Specimens should be examined carefully and full details taken with each capture. Bred material would be most welcome for Mr. J. W. Saunt writing to me (September 1947) reported "I have again taken the new Myopa this year." I understand that Mr. J. E. Collin regards this Isle of Wight form as a new species near to *M. polystigma*, at present undescribed.

Myopa fasciata Mg.

No London records. I possess or have seen specimens from Devon, Dorset, Hants., Herts., and Norfolk taken in the months of May, July to September, so it may yet be found in our area.

Myopa dorsalis F.

No London area records nor have I seen a specimen taken in this country.

Myopa occulta Wied.

A new addition to the British List. Mr. H. W. Andrews wrote on 14th December 1950, " A very rare species apparently. I have 1 ♂ swept off rough herbage on downland at Breamore, Hants., August 1948. Collin to whom I sent it for confirmation said it was the first undoubted British *occulta* he had seen. I searched again and again in late August and September 1948 and again in 1949, without success, for more specimens, although I knew the exact spot I had taken it."

The larvae of this genus have been recorded as parasites of *Vespula vulgaris* L., *Andrena* sp., *Bombus* sp., *Eucera*, and *Colletes*.

REFERENCES.

COLYER, C. N., & HAMMOND, C. O. Flies of the British Isles. Frederick Warne & Co., Ltd., London. 1951.

SÉGUY, E. Études sur les Mouches Parasites, I. Conopides, etc. Lechevalier, Paris. 1928.

SMITH, K. G. V. *The Irish Conopidae*. Proc. or Trans. Royal Irish Academy, in press.

Plant Galls in Surrey, 1951,

By M. Niblett, F.R.E.S.

DURING 1951 fifty-four visits were made to twenty-three localities in Surrey where the Plant Galls mentioned below were seen.

HYMENOPTERA.

TENTHREDINIDAE:—Only three species of Sawfly galls were seen: of these *Pontania proxima* Lebel on *Salix fragilis* and *S. alba* were moderately plentiful; *P. bridgmanni* Cam. on *S. atrocinerea* and *S. caprea* rather more plentiful than usual; and *P. viminalis* L. on *S. purpurea* definitely scarce.

CYNIPIDAE:—Many Cynipid galls on Oak were not seen, some were scarce in a number of areas and locally plentiful in others, and a few species were generally abundant.

On *Quercus petraea*:—*Cynips folii* L. (two only); *C. disticha* Htg., *Andricus curvator* Htg., *A. fecundator* Htg., *A. glandulae* Schnk., *A. ostreus* Gir., *A. quadrilineatus* Htg., *Adleria kollari* Htg., *Biorhiza pallida* Oliv., and *Trigonaspis megaptera* Panz. were seen in moderate numbers; *Andricus inflator* Htg. and *A. solitarius* Fonc. were very scarce, while *Neuroterus albipes* Schnk. f. *laeviusculus* Schnk., *N. baccarum* L. and f. *lenticularis* Oliv. were generally plentiful, *baccarum* on both leaves and catkins.

On *Quercus robur*:—*Cynips folii* L. galls were seen in small numbers in many areas but on Bookham Common an isolated tree was observed, literally covered with these galls; *C. folii* L. f. *taschenbergi* Schlcht., *C. divisa* Htg., *Andricus solitarius* Fonc., and *Neuroterus albipes* Schnk. were seen in very small numbers; *A. fecundator*, *A. ostreus*, *A. quadrilineatus*, *Adleria kollari*, *B. pallida*, *Neuroterus aprilinus* Gir., *N. baccarum*, *N. albipes* f. *laeviusculus*, *N. schlechtendali* Mayr, and *N. numismalis* Oliv. were all seen in moderate numbers, but *N. baccarum* f. *lenticularis* was generally very plentiful.

On *Rosa* spp.:—*Rhodites rosae* L., *R. mayri* Schlcht., *R. spinosissimae* Gir., spiked pea-galls of *Rhodites dispar* Niblett, smooth pea-galls of *R. eglanteriae* Htg. and/or *R. dispar*, were all seen in moderate numbers.

On *Centaurea scabiosa*, *Isocolus rogenhoferi* Wachtl and *Phanacis centaureae* Först. were found in several localities; on *Centaurea nigra* a few galls of *Isocolus jaceae* Schck. were found; on *Hypochoeris radicata* a few galls of *Aulacidea hypochoeridis* Kieff. were seen in several localities, including Bookham Common. On *Tragopogon pratensis* at Mickleham Downs and *T. minus* at Bookham Common, several stems were found heavily galled by *Aulacidea tragoponis* Thoms.; on *Glechoma hederacea* a few galls of *Liposthenes latreillei* Kieff. were seen.

DIPTERA.

TRYPETIDAE:—On *Cirsium arvense, Urophora cardui* L. was seen in moderate numbers, on *C. vulgare U. stylata* F. was fairly plentiful, on *Centaurea nigra U. jaceana* Her. was generally plentiful and as widely distributed as usual, on *Hieracium umbellatum* galls of *Hoplochaeta pupillata* Fln. were rather plentiful in several areas, and on *Senecio erucifolius* and *S. vulgaris* a few galls of *Sphenella marginata* Fln. were seen.

CECIDOMYIIDAE:—Cecid galls except with a few species were not very plentiful, but a few of the more uncommon species were found in some numbers mostly in a single locality; of these, on *Cornus sanguinea Craneobia corni* Gir., on *Galeobdolon luteum Dasyneura galeobdolontis* Winn., on *Populus tremula Dasyneura populeti* Rubs. and *Syndiplosis petioli* Kieff., on *Tamus communis Schizomyia tami* Kieff., on *Ulmus glabra Janetiella lemeei* Kieff., may be mentioned; on *Rubus* sp. one gall of *Lasioptera rubi* Heag. was found; galls of *Hartigiola annulipes* Htg. on *Fagus sylvatica* were exceptionally scarce in many areas.

Other galls found were on *Acer campestre Massalongia? aceris* Rübs., on *Achillea millefolium Rhopalomyia millefolii* H. Lw., on *Barbarea vulgaris Dasyneura sisymbrii* Schnk., on *Betula* spp. *Anisostephus betulinum* Kieff. and *Plemeliella betulicola* Rübs., on *Bryonia dioica D. bryoniae* Bché., on *Centaurea scabiosa Loewiola centaureae* F. Lw., on *Crataegus monogyna D. crataegi* Winn. and *D. oxyacanthae* Rübs., on *Daucus carota, Pastinaca sativa,* and *Silaum silaus, Kiefferia pimpinellae* Kieff., on *Daucus carota* and *Silaum silaus Lasioptera carophila* F. Lw., on *Chamaenerion angustifolium Dasyneura epilobii* F. Lw., on *Galium mollugo Geocrypta galii* H. Lw., on *Hypericum perforatum D. hyperici* Br-W., on *Hypochoeris radicata Contarinia hypochoeridis* Rübs., on *Ligustrum vulgare Placochela ligustri* Rübs., on *Lotus corniculatus Contarinia loti* Deg., on *Lychnis album Contarinia steini* Karsch, on *Glechoma hederacea Rondaniella bursaria* Br-W., on *Polygonum amphibium Wachtliella persicariae* L., on *Populus tremula Harmandia globuli* Rübs. and *H. loewi* Rübs. (*tremulae* Winn.?), on *Prunus spinosa Putoniella marsupialis* F. Lw., on *Quercus robur* and *Q. petraea Macrodiplosis dryobia* F. Lw., on *Rosa* spp. *Wachtliella rosarum* Hardy, on *Salix atrocinerea Iteomyia capreae* Winn., *I. major* Kieff., *Rhabdophaga rosaria* L., and *R. salicis* Schnk., on *Salix caprea I. capreae* and *R. rosaria*, on *Rubus* spp. *Dasyneura plicatrix* H. Lw., on *Sambucus nigra Placophela nigripes* F. Lw., on *Senecio erucifolius* and *S. jacobaeae Contarinia jacobaeae* H. Lw., on *Solanum dulcamara Contarinia solani* Rübs., on *Sonchus arvensis Cystiphora sonchi* F. Lw., on *Stachys sylvatica Wachtliella stachydis* Br-W., on *Tilia europaea*

Contarinia tiliarum Kieff., on *Tragopogon pratensis Contarinia tragoponis* Kieff., on *Taxus baccata Taxomyia taxi* Inchb., on *Trifolium pratense* and *T. repens Dasyneura trifolii* F. Lw., on *Urtica dioica Dasyneura urticae* Perris, on *Veronica chamaedrys Jaapiella veronicae* Val., on *Viburnum lantana Contarinia lonicerearum* F. Lw. and *Phlyctidobia solmsi* Kieff., on *Vicia cracca Anabremia viciae* Kieff. and *Dasyneura spadicea* Rübs., on *Filipendula ulmaria Dasyneura pustulans* Rübs. and *D. ulmariae* Br-W.

Chloropidae :—Galls of *Lipara lucens* Mg. were plentiful on *Phragmites vulgaris* at the Black Pond, Esher Common.

HOMOPTERA.

Aphidae :—The few species of Aphid galls seen were generally plentiful where they occurred: on *Artemisia vulgaris Cryptosiphum artemisiae* Pass., on *Picea excelsa Adelges abietis* Kalt., on *Ulmus glabra Eriosoma ulmi* L. and *Tetraneura ulmi* Deg.

Psyllidae :—Both the following species were generally plentiful, but no others were seen: on *Fraxinus excelsior Psyllopsis fraxini* L., on *Rhamnus catharticus Trichochermes walkeri* Först.

COLEOPTERA.

Only one species of Beetle gall was seen: on *Rumex acetosella* at Addington the leaves were heavily galled by *Apion frumentarium* L.

ERIOPHYIDAE.

The majority of the Mite galls seen were fairly plentiful: on *Alnus glutinosa Eriophyes laevis* Nal., *E. laevis inangulis* Nal., and *Eriophyes* sp., on *Crataegus monogyna E. goniothorax* Nal., on *Acer campestre E. macrochelus* Nal. and *E. macrorrhynchus* Nal., on *Malva moschata E. gymnoproctus* Nal., on *Origanum vulgare E. origani* Nal., on *Prunus spinosa E. similis* Nal., on *Poterium sanguisorba E. sanguisorbae* Can., on *Solanum dulcamara E. cladophthirus* Nal., on *Sorbus aria E. pyri* Pagst., on *Tilia europaea E. tiliae* Nal. and *E. tiliae liosoma* Nal., on *Thymus serpyllum E. thomasi* Nal., on *Ulmus campestris E. ulmi* Nal., on *Viburnum lantana E. viburni* Nal., on *Sambucus nigra Epitrimerus trilobius* Nal.

FUNGI.

Few Fungus galls were seen. Leaves of *Azalea ledifolia* and *Rhododendron ferrugineum* sent to me in June from Horley by Mr. J. Tetley were heavily galled by *Exobasidium rhododendri* Cram. On Bookham Common *Filipendula ulmaria* was also rather heavily galled by *Triphragmium ulmariae* Lk.

The Survey of Bookham Common.

TENTH YEAR.

Progress Report.

THE attendance, and the output of work, at meetings have been well maintained, a very satisfactory feature being a marked increase in the number of botanical workers. The initial phase of the preparation of floristic and faunistic lists appears now to be giving way to the study of problems of ecological interest and an attempt, here and there, to co-ordinate investigations.

Mr. D. Macer-Wright, who lives on the edge of the Common and has been for several years honorary secretary of the National Trust's Bookham Commons Committee, contributes an account of the way in which the Common is administered and some of the difficult problems encountered in its management.

The entomologists have been active, although surprisingly little interest is taken in the Lepidoptera. Dr. Easton contributes a further instalment of his annotated list of the beetles on p. 39, while on p. 49 appears a paper on the little-worked group of the Hemiptera by Mr. D. Leston.

After achieving the difficult task of building up an enthusiastic team of ornithological workers and organising the work, Mr. P. W. E. Currie has been able to hand over to Dr. G. Beven and return to his study of the Sawflies which, although much interrupted, has progressed sufficiently to make possible some account of the fauna of the Common. Some attention has also been paid to the Aculeate Hymenoptera, particularly to the colonies on the sandy tracks near Hundred Pound Bridge. He proposes to take advantage of Mr. Le Gros' work on the spiders to make a special study of the spider-hunting Pompilidae.

Mr. W. Ruttledge is studying the Short-horned Grasshoppers with special reference to their distribution and habitat preference. He has found that ant hills have a special significance in the overgrown and ungrazed grassland that covers most of the Plain, by providing areas of dry and friable soil sparsely covered with close cropped vegetation which is very attractive to grasshoppers.

Mr. L. Parmenter and Mr. M. Niblett are studying the Diptera and a note by Mr. Niblett appears on p. 47. He is making an intensive study of the distribution of the larvae of the Trypetidae in preparation of a further paper.

Col. C. J. F. Bensley and Mr. B. Taylor have continued their studies of the seasonal fluctuations in molluscan numbers in the Isle of Wight Pond and their results appear on p. 34.

The enthusiastic team of ornithologists, with a nucleus of Miss E. M. Hillman, Miss M. E. Kennedy and Mr. S. H. Chalke, led by Dr. G. Beven, is carrying on the survey in Eastern Wood, mapping and counting bird territories and observing feeding habits. They are also counting all Grey Squirrels seen in the wood. Observations have been started on the feeding habits of insectivorous and frugivorous birds in Eastern Wood and on the summer territories of Tree Pipits and Yellow Hammers on Western Plain.

Messrs. E. B. Bangerter, C. P. Castell and A. W. Jones form the nucleus of the vegetation team and have received frequent help from Mrs. Baxter, Miss M. Roberts and Mr. E. W. Groves. Their work includes a census of the scrub vegetation of part of Central Plain, a preliminary re-survey of the ponds, and, in co-operation with Mr. W. Ruttledge, an investigation of the vegetation of a short grass area in Central Plain, with numerous ant hills and much favoured by grasshoppers. Mr. A. H. Norkett has continued his studies of the woodland bryophytes.

C. P. C.

The Fresh Water Mollusca of Bookham Common.

By C. J. F. Bensley.

Previous papers by J. L. Harrison and by the author on the freshwater mollusca of Bookham Common have appeared in the *London Naturalist*, no. 24, for 1944 (Reprint no. 33) and *L.N.*, no. 27, for 1947 (Reprint no. 46). The latter paper covered a two-year period up to the end of 1947, by which time, owing to encroaching vegetation and leaks in the retaining bank at the Western end, the Isle of Wight Pond had completely dried up. The present paper deals chiefly with the repopulation of this pond by mollusca after the repair and refilling in December 1948, until December 1951.

The Isle of Wight Pond was dry from about August 1947 until December 1948 except for occasional puddles of rain water. When these puddles were present they usually contained a few juvenile *Planorbarius corneus* but no other species, neither did any digging of the bed of the pond reveal any living mollusca of any species.

Late in 1948, extensive work on many of the streams, ditches and ponds was carried out. Bookham Stream, Central and Greendell Ditches were cleared of weeds and dug out. The retaining banks of Lower Eastern and Isle of Wight Ponds were repaired, widened and strengthened. The clay required for the widening was taken from the beds of the ponds themselves resulting in a deepening of the ponds at the western end in each case. The clearing of the ditches permitted a good flow of water and consequent scouring of the bottom. This general clearing of the waterways has had a considerable effect on the molluscan population of the Common as a whole.

Repopulation of the Isle of Wight Pond.

By Dec. 12th, 1948, rebuilding of the bank permitted a fair amount of water to collect behind it, but not much disturbance of the bottom of the pond had yet taken place, so the water was moderately clear. A few young *Planorbarius corneus* and one *Planorbis planorbis* were found. A month later the pond was full to overflowing with a large area of land vegetation submerged. The digging for additional clay to thicken the bank had churned up the water into a pea-soup-like consistency, and the arrival of a flock of a dozen domestic geese provided another factor inimical to the mollusca. From now on the pond was allowed to settle down, and after a couple of months the geese went, presumably the way of all geese. Between January and July 1949, no mollusca were found. The water level fell very low in the summer and the only animal scooped during this period was a crustacean, presumed to be *Gammarus pulex*, but may have been *Eucrangonyx gracilis*. In August, however, there were a fair number of young *P. corneus*, a very occasional *P. planorbis* and one young *Succinea pfeifferi*, so molluscan repopulation had really begun. *Lymnaea peregra* began to appear in November 1949 and *L. palustris* in December.

By February 1950, sufficient numbers of mollusca were obtainable to start sampling on more systematic lines. In fact, animal life was firmly re-established; the following also being noted on Feb. 12th, 1950: —a pair of Mallard, Moorhen, Palmate Newt, the Water-Louse (*Asellus aquaticus*), a Pea-Cockle (*Pisidium obtusale*), Water-beetle larvae (*Dytiscus*), Water-boatmen (*Corixa* and *Notonecta*) and Caddis-fly larvae of the genera *Glyphotaelius*, *Phryganea*, *Leptocerus* and *Limnophilus*. In addition, in the following month, Little Grebes, Leeches, Damsel-fly nymphs, the water-bug (*Ilyocoris cimicoides*) and some Tadpoles were all present. The water level again got low in the summer, and in the autumn the pond had a set-back; some local inhabitants appear to have obtained unauthorised access to the key of the sluice, and emptied the pond. This matter was put right and by November the pond was normal again. It has remained so till the end of 1951. Domestic ducks appear on it from time to time and the water level gets very low in the summer.

The method of sampling for mollusca was exactly the same as for 1946-7, but on many occasions I had the valuable assistance of Mr. B. Taylor. He used a similar scoop to mine, so there is no difference in the manner of producing the two series of results.

The results for 1950-1 are shown in Table I and a corresponding graph of relative percentages (fig. 1) is included. A comparison of the two graphs, however, shows striking differences. In the 1946-7 graph, *Planorbis planorbis* was generally the commonest but there was a very rapid rise and fall of *Aplexa hypnorum*. In the present series, *Lymnaea peregra* becomes the commonest species and remains so with *P. planorbis* in second place. A curious feature is the decline of *L. palustris* for which there is no apparent reason. *Aplexa hypnorum* is confined in small numbers to the shallow North-Western corner of the pond. The relative proportions and probably even actual numbers of at any rate *L. peregra*, *P. planorbis* and *P. corneus* would seem to be more or less stabilized.

An attempt was also made to make some analysis of habitats. This proved rather complicated owing to seasonal variation of vegetation. For example, in winter there are only really four possible habitats:—dead *Sparganium ramosum*, submerged *Agrostis stolonifera*, clumps of

TABLE I.

	Limnaea peregra	*Limnaea palustris*	*Planorbis planorbis*	*Planorbarius corneus*	*Aplexa hypnorum*	Totals
12th February 1950	59	12	2	8	3	84
12th March	54	15	4	3	14	90
2nd-23rd April	42	67	11	21	10	151
14th May	19	53	34	24	25	155
11th June	103	51	43	10	4	211
9th July	180	20	105	22	9	336
13th August	287	37	298	36	3	661
10th September	192	2	126	29	1	350
8th October	Pond dry.		No mollusca.			
12th November	72	3	82	11	0	168
10th December	63	31	14	5	0	113
14th January 1951	69	20	7	0	0	96
11th February	58	37	9	3	0	107
11th March	106	24	4	0	0	134
8th April	93	59	9	1	5	167
6th May	88	30	8	1	41	168
June	No count.					
8th July	282	8	61	2	2	355
12th August	365	0	82	9	0	456
9th September	359	3	228	16	0	606
7th October	311	1	123	25	0	460
11th November	291	13	88	31	2	425
9th December	424	18	147	37	8	634
Totals	3517	504	1485	294	127	5927

TABLE II.

Type of Habitat	*Lymnaea peregra*	*Lymnaea palustris*	*Planorbis planorbis*	*Planorbarius corneus*	*Aplexa hypnorum*	Totals
Bare mud	96	18	88	26	0	228
Dead *Sparganium*	428	83	65	31	10	617
Living *Sparganium*	509	48	280	56	4	897
Agrostis sp.	121	114	15	11	21	282
Glyceria fluitans	261	103	107	28	41	540
Juncus effusus	54	13	22	3	13	105
Galium palustre	70	11	24	3	7	115
Ranunculus peltatus	41	19	38	1	1	100
Equisetum limosum	5	2	2	2	0	11
Lemna trisulca	832	60	417	44	5	1358
Potamogeton natans	249	3	67	12	0	331
Sparganium simplex	8	0	37	3	0	48
Hypnum riparium	32	1	10	3	0	46
Submerged land vegetation merging with *Glyceria* and *Agrostis*	139	7	44	3	3	196
Floating sticks	5	3	0	1	0	9
Wall of Sluice	535	56	202	39	1	833
Totals	3385	541	1418	266	106	5716

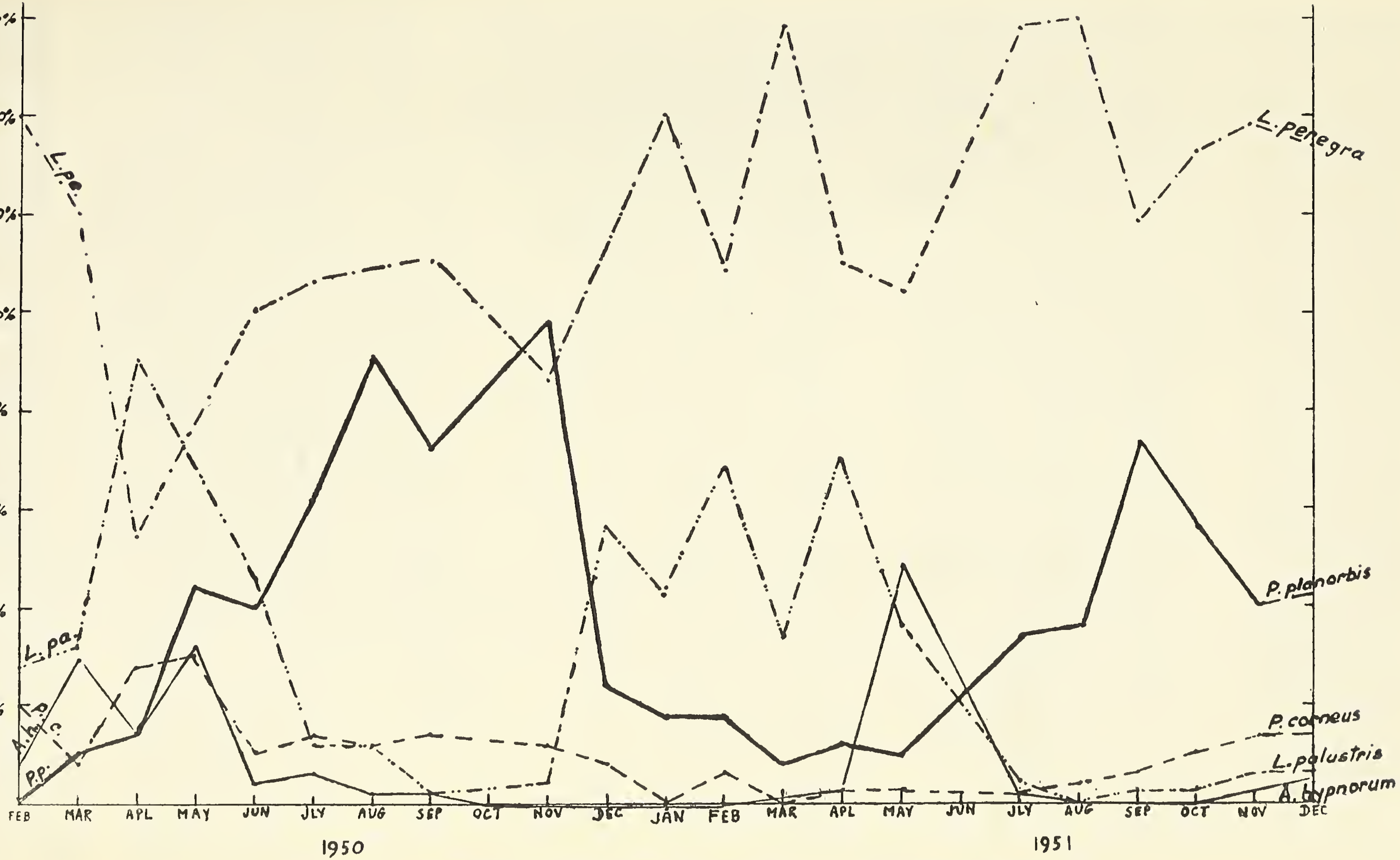


Fig. 1. Seasonal fluctuations of species in Isle of Wight Pond.

Juncus effusus and the wall of the sluice; whereas in summer there are at least ten more. I was of the opinion that although the principal food of mollusca is algae, cover had a lot to do with habitat, especially of the young. This was based on the large numbers of young found in *Lemna trisulca* and *Ranunculus peltatus.* I was forced, however, to change this opinion, for in November whilst patches of dying *Lemna* floating on the surface yielded mollusca, thick masses of living *Lemna* on the bottom yielded none at all.

Further comparisons of habitat counts cannot really be made. Even if a given number of scoops in each habitat were made it would not give a fair answer for several reasons. For example, a scrape up the wall will, in favourable circumstances, sometimes produce forty to fifty mollusca and will probably include nearly all those in the path of the scoop. To get fifty mollusca off the stems of *Sparganium* would require twenty or more scoops and all of the mollusca in the path of the scoop would certainly not be taken. Again, the submerged moss (*Hypnum riparium*) appears to be very popular (over thirty mollusca in one dip) but its extent in the pond is only a few square inches as against the many square yards of *Sparganium ramosum.* A certain amount can be deduced from the large units in Table II, i.e. those where the number of *L. peregra* taken were of the order of 500. One might infer that whatever algae are to be found on the dead *S. ramosum*, they are more attractive to *L. peregra* than to *P. planorbis*; also that it is not so attractive to *P. planorbis* as the food to be found on living *S. ramosum*, *Lemna trisulca* or the wall. A survey of all the habitat counts shows, however, that the method of sampling is fair to all species and does not give a false picture of their relative frequencies. All that can be said is that dead *Sparganium ramosum* is the most reliable all-the-year-round habitat, the sluice wall the most highly populated in winter and that *Juncus effusus* is a poor molluscan habitat at any time. Species do not show any particular preferences except *Aplexa hypnorum*, which is found only in the shallow water near the margin and appears to have a preference for *Glyceria fluitans.*

The foregoing paragraphs deal almost entirely with the five common Gastropods of the pond, but two species of Bivalves, *Sphaerium lacustre* and *Pisidium obtusale*, have become fairly plentiful. Another Gastropod, which had not been noted at all during the 1946-7 period, namely *Acroloxus* [*Ancylus*] *lacustris*, is now found very occasionally and should increase. I think it will be agreed that the Isle of Wight Pond has become repopulated remarkably quickly as far as mollusca are concerned. From this fact and that, except for the *Acroloxus*, there are no new species, it is almost certain that the present population are the descendents of the survivors of the pre-drought fauna despite the fact that they appeared to die out completely during the dry period.

The Ditches and Streams.

The clearing of the streams and ditches had a considerable effect on the previous molluscan population. The numbers of the mollusca have been much reduced. In Bookham Stream there are hardly any to be found, except *Potamopyrgus jenkinsi*, till the site of Bank's Pond is reached. From there to the junction with Bank's Stream mollusca are fairly plentiful and much as shown in the table in *L.N.* for 1947, p. 52. *Lymnaea truncatula* has disappeared from its localities in South and in Greendell Ditch, the only species now common in Greendell Ditch being *P. jenkinsi*. Central Ditch is almost devoid of mollusca.

OTHER SPECIES AND LOCALITIES.

Two new species for Bookham Common require to be added to A. E. Ellis' list of the Land Mollusca (*L.N.*, no. 27, for 1947, p. 58). These are *Acanthinula aculeata* (Müller) from Eastern Wood and *Clausilia bidentata* (Ström) fairly frequent in Station Copse and Stents Wood North. The latter species has been known, apparently erroneously, to British naturalists till quite recently as *C. rugosa* (Drap.) (see *Journal of Conchology*, vol. 17, p. 267). A single specimen of *Planorbis albus* Müller was found in the Isle of Wight Pond by Mr. B. Taylor on May 14th, 1950, but as it has not been found again it must be considered an accidental introduction.

SUMMARY.

1. Extensive repairs and draining of the ponds and streams of Bookham Common took place in 1948.
2. The Isle of Wight Pond has been repopulated by mollusca and other aquatic fauna and flora.
3. The relative proportions of the common species of Gastropods show considerable differences from those recorded before the repairs.
4. Molluscan habitats are discussed.
5. The cleaning of the streams and ditches has reduced the numbers and species of the mollusca very greatly.
6. Two species new to the Common are recorded.

The Coleoptera of Bookham Common.

CARABOIDEA (GEODEPHAGA).

By ALAN M. EASTON, M.B., B.S., F.R.E.S.

The Geodephaga are represented on Bookham Common by approximately one hundred species, amounting to a little more than a quarter of those recorded for the whole British Isles. This fraction is low in comparison with that obtaining in the case of the Rhynchophora, the Malacodermata, and the Phytophaga, and at first sight occasions some surprise. When one recalls, however, how local and scarce are so many of our British ground beetles, the number taken in the small area under consideration assumes more satisfactory proportions.

As would be expected, species favouring damp low-lying situations predominate over those whose preferences are for higher and drier ground; thus we find that the Genus *Bembidion* Latreille is represented by one-third of the national species, whilst in the case of the Genus

Agonum Samouelle no fewer than one half of the total have been recorded. On the other hand many common species are either rarely met with, or apparently entirely absent. Amongst these latter may be cited the common *Carabus violaceus* L., *Leistus spinibarbis* F., *Pseudophonus rufipes* Deg., *Amara similata* Gyll., *A. familiaris* Duft., *A. aulica* Panz., *Calathus melanocephalus* L., and *Metabletus foveatus* Geoff. *Agonum dorsale* Pont. so very frequent under stones in London suburban gardens is met with rarely in the Great Bookham district, and is amongst those species whose occurrence on the Common has not yet been noted.

Methods of capture include the usual ones of search under stones, turves, fallen leaves, logs and loose bark, amongst roots and in crevices, and in a whole variety of similar secluded corners where these beetles are so wont to hide. Grubbing amongst roots on the half dried beds of ponds and ditches in the summer months is always profitable; many of the species are to be seen running on footpaths or on the flat stretches of mud flanking the streams, especially in sunny weather. Again others are found, often in large number and wide variety, by shaking the heaps of grass and reed refuse left along their banks after the periodical clearing of streams and ditches, or in dumps of garden refuse or straw occasionally deposited on the edges of the Common, or near the roads. Flood-sweeping is always profitable, whilst the examination of moss should never be neglected. Nests of various sorts, such as those of the moorhen, the grey squirrel, and the field vole, provide their quota of ground beetles, and on the plains and near the ponds the larger grass tufts repay examination. Artificial traps have not been employed, with the exception of those fortuitously provided by the slit trenches and gun-pits dug during the late War and in which especially *Carabus nemoralis* Muell. used to be caught and drowned in some numbers.

In the following list the names employed are those used by Messrs. Kloet and Hincks (1945, A Check List of British Insects, Stockport), and the general pattern corresponds to that previously adopted. Records, except where otherwise stated, refer solely to the personal experience of the author during the fourteen years up to November 1949 when illness temporarily interrupted intensive collecting. Months of capture are indicated by Roman figures, whilst the bracketed numerals correspond to the grid references of the Survey Base Map, and serve to pin-point the localities of rarer or more local species. As has been the case with previous lists, an immense amount of most valuable assistance has most generously been given by Mr. F. J. Coulson, who has not only graciously allowed quotation from his "Coleoptera of Bookham Common" (*Proc. S. Lond. Ent. and Nat. Hist. Soc.*, 1941-42) of all species not personally taken, but has moreover loaned all such material for verification of determinations, as well as giving much other valuable information and data. Species included in the list in this way are marked with an asterisk, whilst a double asterisk denotes those included on information obtained by personal communication from various other collectors. To these and to Mr. F. J. Coulson, as well as to Mr. A. A. Allen who has kindly checked all doubtful determinations, grateful acknowledgment is now expressed.

CARABIDAE

Cicindela campestris L. IV. A number of examples of this handsome beetle were encountered running on the paths and on the wing, April 17, 1949 (424).

**Carabus granulatus* L. On June 7, 1941, Mr. F. J. Coulson found a larva under leaves which was determined by Dr. K. G. Blair as belonging to this species.

C. nemoralis Muell. IV. One living specimen was secured under bracken in a gun pit, April 16, 1944 (826), though at about the same time numerous examples were to be found drowned in the slit trenches dug by the Home Guard.

Cychrus rostratus L. VII. One example of this, the only British representative of its genus, was taken under damp straw (284), July 16, 1944.

**Leistus fulvibarbis* Dej. Mr. F. J. Coulson captured one example on May 27, 1941.

L. ferrugineus L. V, VI, XI. Amongst vegetable refuse, and on mud beside the Bookham Stream, under turf in a gun pit (826), in moss and under the bark of a damp willow log beside Bayfield Pond. Not uncommon.

Nebria brevicollis F. III, X. Two examples under a log and one under bracken refuse (834).

Notiophilus palustris Dufts. III, VI, IX. In moss (381), in sedge refuse and on the bank of Bookham Stream. Not common.

N. substriatus Water. VII. Under stones and leaves in ruts along Broadway. Only one example of this beetle has been encountered.

N. rufipes Curt. VIII. Two specimens running on the ground in a higher wooded part of the common.

N. biguttatus F. II, III, VII, IX, X. In moss in winter, under stones and leaves, amongst sticks and bracken refuse. Widely distributed and not uncommon.

Elaphrus cupreus Dufts. IV, V, VI, VIII, IX. Found generally in small numbers running on mud, beside the Bookham Stream, Lower East Pond, and Kelsey's Pond.

E. riparius L. IV, VI. In larger numbers than the last, but apparently much more localised (424)

Loricera pilicornis F. V, IX. Two examples on mud beside the stream (489), and another running on the ground. Not common.

Clivina fossor L. I, III, IV, VII, VIII, IX. Common in moss in Winter; in rotten wood, under logs and stones. Twelve examples were taken by sweeping the flooded banks of Bookham Stream after a heavy rain-storm, July 15. 1945.

Dyschirius aeneus Dej. IV, VI. Amongst roots on the muddy bed of a dried pond, and on mud beside the Bookham Stream (424 and 486). The members of this genus prey on *Bledius* spp., amongst which *B. gallicus* Grav., at least, occurs on the Common.

D. globosus Hbst. VII, VIII, IX. By sweeping the grassy edge of a large puddle after heavy rain (829), by grubbing at the bank of Bayfield Pond, under bark of a damp willow log, and under a stone beside Bookham stream. Less common than the last.

**Asaphidion flavipes* L. Mr. F. J. Coulson took one example on May 27. and another on June 7, 1941.

Bembidion lampros Hbst. VII, IX. Two examples on the ground, one in proximity to dung.

B. properans Steph. I, III, VIII. Hibernating in moss and amongst grass roots on culverts; by sweeping the grassy edge of a large puddle after rain; and on *Gnaphalium uliginosum* L.

B. dentellum Thunb. IV, VI, XI. On mud beside ponds and streams; four specimens under a willow log by Bayfield Pond. Not frequent.

**B. varium* Ol. Mr. F. J. Coulson took single specimens on August 18, 1938, May 3, and June 5, 1939.

B. nitidulum Marsh. IV. Three examples found under leaves in a gun pit (829).

**B. rupestre* L. Two males and one female taken on August 16, 1938, are recorded by Mr. F. J. Coulson; and Mr. A. A. Allen found one under a stone near the Isle of Wight Pond, September 28, 1947.

B. ustulatum L. IV, VI, IX. Under cut reeds and on the muddy banks of Bookham Stream. Not common.

B. genei Kuest. var. *illigeri* Netol. IV, VI. Found singly on the mud beside Bookham Stream (424) on two occasions.

B. gilvipes Stm. III, IV, VI. Occurring singly in moss in a swamp, in flood refuse from the Isle of Wight Pond, on the muddy bank of Bookham Stream, and amongst sedge refuse in the same situation.

B. clarki Daws. II, IV, V, VI, VII, X, XI. Amongst roots in dried ponds, in *Equisetum* refuse, in a moor-hen's nest, and numerous under a willow log beside Bayfield Pond. Widespread and common in damp situations.

B. quadripustulatum Serv. VII. One example taken at roots beside the Lower East Pond, July 7, 1949.

B. quadrimaculatum L. VIII, X. On the ground near horse dung, and beneath *Gnaphalium uliginosum* L. (825), and one in rotting poplar wood (848).

B. doris Panz. I, II, VI, VII, XI. Amongst roots on muddy bed of dried pond, also taken by grubbing at the bank of Bayfield Pond, one under the bark of a sodden willow log, and another by flood-sweeping. Hibernating in winter in moss, and in a stem of *Typha latifolia* L. Not uncommon.

B. articulatum Panz. IV, VI. Taken singly on mud beside Bookham Stream (424) on two occasions.

B. obtusum Serv. IV, VII, X. Several examples taken by sweeping over the flooded verge of Banks Stream after heavy rain (416 and 419), on mud beside Bookham Stream (424), one near manure, and another on the ground (422).

B. harpaloides Serv. III. One example taken under bark of an elm log near Kelsey's Pond (255).

B. biguttatum F. I, II, III, IV, V, VI, VII, IX, X. One of the commonest species of its genus, occurring always in damp situations. In sedge and hay refuse beside the streams, on mud and amongst roots around the ponds; a few in a moor-hen's nest, and one under bark of an elm log.

B. unicolor Chaud. I, II, III, IV, V, VI, VII, VIII, IX, XI, XII. In similar situations to the last, widespread and very common. It is possible, owing to an initial confusion between this species and the next, that some of these records refer to *B. guttula* F.

**B. guttula* F. Included in the list of the late Mr. S. R. Ashby.

B. lunulatum Geof. I, II, IV, VI, VII, IX, XI. In company with, and almost as frequent as *B. biguttatum* F. and *B. unicolor* Chaud.

Trechus obtusus Erichs. VII, XII. In hay and grass refuse, not common.

***Chlaenius nigricornis* F. Taken singly by Mr. A. A. Allen under stones near the Isle of Wight Pond, June 30, 1940, and June 6, 1943, by Mr. H. Last, April 18, 1942, and by Mr. F. D. Buck in a grass tuft, also near the Isle of Wight Pond, April 8, 1951.

**Badister bipustulatus* F. Mr. F. J. Coulson secured one example of this species on May 20, 1940.

**B. sodalis* Dufts. A single male was captured by Mr. F. J. Coulson, April 13, 1935. The author has taken this species sparingly in his garden.

B. dilatatus Chaud. One specimen taken by grubbing at the bank of Bayfield Pond on November 6, 1949, also Mr. F. D. Buck took a single example in a grass tuft near the Isle of Wight Pond, April 8, 1951 (*Ent. mon. Mag.*, 87 : 192).

Harpalus aeneus F. IV, VI, VIII. One example under a stone (422), another running on the ground (188), and a third amongst *Gnaphalium uliginosum* L. (825).

**H. punctatulus* Dufts. Included in the list of the late Mr. S. R. Ashby.

**Stenolophus teutonus* Schrank. Mr. F. J. Coulson records one taken on April 22, 1939. It is understood that this species occurs also at Ashtead Pond and Oxshott.

S. mixtus Herbst. II, IV, V, VI, VII, XI. Amongst roots around the ponds. on mud and in hay refuse beside the streams. Common in damp situations.

**Acupalpus meridianus* L. Two examples taken by Mr. Coulson, June 7 and 30, 1941.

A. dorsalis F. IX. One specimen on the ground beside the crater pond (267). Mr. F. J. Coulson also recorded this species from a single capture made on May 20, 1941.

A. luridus Dej. I, II, III, IV, V, VI, VII, XI, XII. A very common species occurring in damp situations such as moss, hay refuse beside the streams, amongst roots around the ponds, and on the beds of dry ditches.

A. consputus Dufts. V, VI. Amongst roots on the muddy bed of a dried pond, and on the bed of a dry ditch. Not common.

Bradycellus ruficollis Steph. IX. One example taken by sweeping *Scabiosa* (832).

B. sharpi Joy. IV. A single specimen in the nest of a field vole, Eastern Plain.

B. verbasci Dufts. III, IV. Taken singly in moss (262), and under a stone (422).

B. harpalinus Serv. IX. One example found in rotting oak wood.

**Anisodactylus binotatus* F. Mr. F. J. Coulson took one example on June 30, 1940.

Amara plebeja Gyll. VI. A single specimen obtained by beating hawthorn.

A. ovata F. VII. One example on watercress (676).

A. communis Panz. IX, X. Taken singly on two occasions in hay refuse (252 and 455).

A. aenea Deg. I. One specimen found hibernating at grass roots on a culvert (579).

Stomis pumicatus Panz. III, IV. One example on the ground. and another in the nest of a field vole.

Feronia cuprea L. II, IX. In moss (511), not common.

F. caerulescens L. V, VI. Running on a path (579). and on the ground (188). Not common.

F. vernalis Panz. VII. One individual taken at roots beside the Lower East Pond.

F. macra Marsh. IV. A single specimen found under a stone (188).

F. nigra Schall. VII. One specimen under an old cistern in the woods (378).

F. nigrita F. IV. V, XI. One found between bricks below Upper East Pond, two on the bank of Bayfield Pond. and another under bark of a damp willow log in the same locality. also one on mud beside Bookham Stream (489).

F. minor Gyll. II. VI. At roots in damp situations. Not common.

F. strenua Panz. I, II. III. IV. V. VI, VII. IX, X. XI, XII. Very common in damp places, where it is most readily found by shaking hay and sedge refuse beside the streams.

F. diligens Stm. IV. V. VI, VII, VIII. XII. Nearly as common as the last, but prefering slightly drier situations. Under turves and leaves in gun-pits (826 and 829), at roots beside Lower East Pond. in hay refuse. and in a moor-hen's nest on Sheepbell Pond.

F. madida F. III, IV, VII. Under stones and leaves along Broadway. under logs, dead bracken, etc. Not very frequent.

Abax parallelopipedus Pill. & Mitt. IV. VII. Between bricks below Upper East Pond, and under damp straw (284).

Calathus fuscipes Goez. VII. Four examples taken under stones and leaves in the ruts along Broadway.

C. piceus Marsh. VII. One example under a brick (623).

**Agonum marginatum* L. Mr. F. J. Coulson has a fine series of this species taken chiefly in mud-cracks of dried-up ponds in the months of May, June and August, 1938 and 1939.

*A müller*i Hbst. IX. One specimen in moss near Common Road South (865).

A. versutum Gyll. IV, VI. Amongst roots on the muddy bed of a dried pond, and beside Lower East Pond. Not common

A. viduum Panz. var. *moestum* Dufts. II, IV, V, VI, VII. Numerous on mud beside Bookham Stream, in sedge refuse, and amongst roots in similar damp localities.

A. livens Gyll. II, IV. Taken singly under a log (547), and under leaves in a gun-pit (829). Mr. Coulson took this species in small numbers amongst leaves in a dried ditch near Isle of Wight Pond, May and June 1941.

A. ruficorne Goez. III, IV, VI, X. In grass refuse, and on mud, under a log beside Bookham Stream, and two under willow bark near Kelsey's Pond.

A. obscurum Hbst. I, II, III, IV, V, VI, VII, XI, XII. On mud and in hay and sedge refuse beside Bookham Stream, on the banks of Bayfield Pond, and in a moor-hen's nest on the Isle of Wight Pond. Common.

**A. scitulum* Dej. Included in the list of the late Mr. S. R. Ashby.

**A. micans* Nic. Mr. F. J. Coulson records a single example of this species taken on April 18, 1942.

A. fuliginosum Panz. I, II, III, IV, V, VII, IX, X, XI. Another of the species occurring in damp situations, such as in hay and sedge refuse and on mud beside the streams, in or under rotting willow logs, and in moss. Very common.

A. piceum L. IX. Two examples in a moor-hen's nest on Sheepbell Pond. Mr. F. J. Coulson has a long series of this species, which he used to encounter frequently in the months of April, May and June.

**A. gracile* Gyll. Mr. F. J. Coulson took two examples on each of the following dates: April 22, May 3, and May 8, 1939.

A. thoreyi Dej. II. One example found hiding between the layers of a stem of *Typha latifolia* L. growing in the Isle of Wight Pond, February 24, 1946.

**Lebia cyanocephala* L. An example of this rare species was exhibited in September, 1894, by Mr. W. West, the first Curator of the South London Entomological and Natural History Society. He probably secured it during his visit to the Common on August 20, 1894.

Risophilus atricapillus L. I, III, V, X. In hay and sedge refuse by Bookham Stream, and one example by beating hawthorn (188). Not common.

Dromius linearis Ol. I, II, III, IV, V, VI, VIII, IX, XI. Usually to be found in small numbers in hay and sedge refuse by Bookham Stream; also taken on mud, by evening sweeping on the Isle of Wight Plain, and by sweeping *Equisetum*.

D. agilis Fabr. II, IV, VII. Under oak bark, and on one occasion in a squirrel's drey in an oak tree.

D. meridionalis Dej. VI. One example only, by beating elm on Banks Common.

D. quadrimaculatus L. III, IV, XII. Taken once under birch bark, once under willow bark, but found more readily and in moderate numbers in dreys of the grey squirrel.

D. quadrinotatus Panz. I, II. Found singly on two occasions in squirrel's dreys.

**D. quadrisignatus* Dej. Mr. F. J. Coulson captured two specimens by beating an oak branch near Upper East Pond, July 6, 1935.

D. melanocephalus Dej. I, II, IV, VI, X, XII. In hay and sedge refuse by the streams, in moss and rotten wood, one in a grass clump and two in a field vole's nest, also one in a squirrel's nest in an oak.

Metabletus obscuroguttatus Dufts. VII. One example secured by sweeping in flooded meadows beside Banks Stream after a thunderstorm.

A Short History of Bookham Commons Under the National Trust.

By D. Macer-Wright, former Secretary of the Bookham Commons Committee.

In 1923, when the association of the National Trust with Bookham Commons began, a great tract of land in the parishes of Great Bookham and Fetcham (including Great Bookham Common) was sold for building. To prevent such a disaster the local residents subscribed a sum of £1,250, re-purchased Great Bookham Common and presented it to the National Trust for permanent preservation. The National Trust made up a deficiency of £300 between the subscribed money and the purchase price, and later bought back for £150 a number of trees which had been sold for felling.

In 1924 Mr. H. Willock-Pollen, then Lord of the Manor of Little Bookham, presented Little Bookham Common to the Trust; Bank's Common was given by Mr. R. R. Calburn in 1925.

Prior to the Commons' becoming National Trust property they were a favourite haunt of gypsies who, although doing a lot of damage, were beneficial to a certain extent by grazing their horses on the open grassland, which was also kept grazed by cattle from local farms. This not only kept the grass in good condition but also prevented the blackthorn from spreading and, no doubt, slowed the spread of bracken. The gypsies were banned when the Commons became National Trust property, but grazing continued on a small scale until 1942. In 1948 a wide area of grassland (Western Plain) was burnt off in an effort to remove the many years' accumulation of dead and matted grass which had formerly been kept down by grazing, but the policy of burning was not continued for fear of discouraging the nesting of birds in the area. However, it is interesting to note that, now the grazing has stopped, the skylark no longer nests here.

National Trust property is divided into two groups—those run and financed by the National Trust Head Office and those, such as Bookham Commons, run by voluntary Local Committees. Property managed by Local Committees is expected to be financially self-supporting and receives no assistance from the funds of the National Trust. Since 1923, when the Local Committee was formed, it has had an up-hill, and not always successful, fight for money. Right from the start, not only did it owe £450 to the National Trust, but also it was faced with the task of tidying up the Commons with very inadequate funds for the purpose.

As part of the task, dead trees were felled in each year from 1923 to 1930. The record of numbers for each year is irregular, but some idea of the number of dead trees then on the Common can be gained from the fact that, in 1930 alone, 125 were removed. In 1924 the Pound had to be repaired and in the following year a certain amount of replanting of trees took place and, in an effort to raise money, the Committee decided to sell loam and turf, a practice that went on until 1948. In 1925, too, the Isle of Wight pond was repaired and the sluice gate fitted. In 1926 the cottage owned by the National Trust on the Isle of Wight was repaired and the well cleaned out. Oak and ash trees were planted in 1929, during which year the Common also suffered from six fires. Throughout this period the work of cleaning ditches, cutting new ones, repairing culverts and thinning of undergrowth went on, and by 1937 £100 had to be borrowed from the National Trust to pay for this work. The following year a further £100 was borrowed for the same purpose, which meant that for several years afterwards the Committee was in debt and had, in consequence, to curtail the employment of labour. In 1939 the bank balance stood at £5!

Then the war came. For the duration of the war practically no maintenance work was carried on. In 1941 the military authorities took over parts of the Common and great damage was done to the woods, rides and turf by tanks and lorries, for which the Committee received £612 17s. as compensation in 1947. In 1948 the bulk of this was spent on cleaning the ditches and re-inforcing the west banks of Isle of Wight and Lower Eastern ponds. In the following year £70 of the residue was spent on an Allen Auto-Scythe, with which the keeper has been able to clear and keep clear some of the rides and footpaths.

At the end of 1947 the Surrey Agricultural Executive Committee "notified the Secretary of the National Trust of their intention to take possession of and cultivate about twenty acres of Little Bookham Common lying between Bayfield and Hundred Pound Bridge." A meeting was called of representatives of the interested parties, the S.A.E.C., the National Trust Head Office, and the Local Committee, and after a strong protest by the Local Committee, the S.A.E.C. accepted a counter-proposal to take possession of 20 acres of Bank's Common, although the Local Committee pointed out that it was strongly opposed to the cultivation of any part of the Commons.

In the same year the Committee decided to stop the digging of loam and the cutting of turf. Cars were forbidden to park away from the roads, notices being displayed to this effect. A long-term policy of thinning the woodlands was agreed upon, in which it was planned that, each winter, a cover, or covers, should be thinned, starting with those in the most urgent need. This scheme will take about fifteen years to complete, by which time the first covers to be thinned will be ready for more attention. Great care is taken in the marking, and every tree, whatever its size, is considered individually, its species, timber value, and natural beauty taken into account. Ideally the Committee would employ labour to carry out the thinning exactly as required but this is impossible owing to lack of funds. In fact, a marked cover is sold to a merchant who works under the strict terms of a contract. Even so, with the inadequate supervision at the Committee's disposal, it is not possible to ensure that the work is carried out conscientiously in every case; with the result that, sometimes, insufficient care is taken with felling; the lops and tops are not always cleared or burnt; and tracks are driven through the covers for the convenience of the merchant with no consideration for the woods. Nevertheless on balance the damage to the woodlands is far outweighed by the improvement.

So far, 32 dangerous trees on the Cobham road have been felled; Mark Oak and Stents Wood West have been thinned and a number of beech trees, which were presented by the National Trust, have been planted. The following covers are now in the process of being thinned: Hill House Wood, Kelsey's Wood, Eastern Wood.

The main expenditure of the Committee is for the wages of the Common Keeper which last year (1951) amounted to about £270. The main receipts come from Rents, the shoot £40, the cottage £19, and wayleaves* about £15; sales of wood, holly, and pea-sticks vary from year to year: in 1950, £163 and, in 1951, £95; subscriptions, and collections from cars during the summer, amount to, perhaps, £100.

Postscript.

Bookham Commons have been saved from undesirable development and kept in a natural condition. But, without proper and adequate management, nature will take over control and the woods and woodland paths will, and have already in parts, become dense impenetrable oakwood; scrub and, in its turn, oakwood will spread across the open plains; the ponds, ditches and streams will become choked with detritus and vegetation. The final result will be monotonous and uninteresting to both naturalist and general public. Human control, however, costs money and the Bookham Commons afford an unfortunate example of an area of land, which can never hope to be, and should not be expected to be financially self-supporting. It was not endowed, as many other areas were, when handed over to the National Trust. Not being an area of outstanding scenic beauty, it arouses no interest in the general public, nor even among the local residents. This general apathy must be most discouraging to the Local Committee and they, and especially their officers, deserve the thanks of all users of the Common for achieving as much as they have with such pitifully meagre resources.

C. P. C.

Notes on some Diptera of Bookham Common, 1951.

By M. Niblett, F.R.E.S.

The following records of Diptera supplement those given in Mr. Parmenter's paper on the Diptera of Bookham Common (*L.N.*, No. 29, p. 98). A number of species not previously found on the Common are here recorded. The records are based on the discovery of the larvae and, where necessary to confirm the identification, the breeding of the flies.

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*Wayleaves are annual rents for the use of another's land, e.g., payment for a sewer, water-pipe, lamp post, telegraph pole or for the use of a footpath or carriage way to private property.

PALLOPTERIDAE.

Palloptera parallela F.:—A few larvae of this species were found in flower-heads of *Cirsium vulgare.* Not previously recorded from the Common.

P. trimacula Mg.:—Numerous larvae of this species were found in the stems of *Angelica sylvestris.* Not previously recorded.

TRYPETIDAE.

Phagocarpus permundus Harris:—Larvae in fruits of *Crataegus monogyna* were found in a number of areas.

Philophilla heraclei L.—Larvae were found in some numbers in leaf-mines on *Heracleum sphondylium* and *Pastinaca sativa*; a few were also found on *Apium nodiflorum.* All the flies emerged in July and August of the first year.

Acidia cognata W.:—Numerous mines in leaves of *Tussilago farfara* containing larvae of this species were found during October. Not previously recorded.

Zonosema alternata Fln.:—Larvae were found to be generally plentiful in fruits of *Rosa canina* in many areas, a few also in those of *R. arvensis.* Not previously recorded.

Chaetostomella onotrophes Lw.:—A few larvae were found in flower-heads of *Centaurea nigra*, *Cirsium arvense* and *C. palustre.*

Trypeta falcata Scop.:—A few larvae of this species were again found in stems of *Tragopogon minus.*

T. ruficauda F.—Numerous larvae were found in flower-heads of *Cirsium palustre.*

T. tussilaginis F.:—A number of larvae were found in achenes of *Arctium majus* and *A. minus.*

Xyphosia miliaria Schrk.:—Flower-heads of *Cirsium arvense* and *C. palustre* were found with a number of larvae of this species in them.

Terellia serratulae L.:—A number of larvae were found in flower-heads of *Cirsium vulgare.* Not previously recorded.

Urophora quadrifasciata Mg.:—First-brood larvae were found to occur in some numbers in flower-heads of *Centaurea nigra.*

Ensina sonchi L.:—Larvae and pupae were generally plentiful in flower-heads of *Sonchus arvensis.*

Paroxyna elongatula Lw.:—Intensive search for the larvae of this species in flower-heads of *Bidens tripartita* has again failed to provide a single specimen.

Tephritis bardanae Schrk.:—Larvae of this species were found in flower-heads of *Arctium majus* and *A. minus.*

T. vespertina Lw.:—Flower-heads of *Hypochoeris radicata* contained numerous larvae or pupae of this species.

The galls of following species of Trypetidae were also seen in some numbers:—*Urophora cardui* L. on stems of *Cirsium arvense*; *U. jaceana* Her. in flower-heads of *Centaurea nigra*; *U. stylata* F. in flower-heads of *Cirsium vulgare*; *Hoplochaeta pupillata* Fln. in flower-heads of *Hieracium umbellatum*; a small number of galls of *Myopites blotii* Bréb.

in flower-heads of *Pulicaria dysenterica*, and of *Sphenella marginata* Fln. in those of *Senecio erucifolius* were also found.

AGROMYZIDAE.

Melanagromyza aeneiventris Fln.:—Numerous flies of this species emerged in June from pupae in stems of *Angelica sylvestris*, collected 6.v.51. Not previously recorded.

Melanagromyza sp.:—Larvae possibly of the above species or of *M. lappae* Mg. were found in stems of *Centaurea nigra*, *Heracleum sphondylium*, *Pastinaca sativa* and *Silaum silaus*.

Agromyza anthracina Mg. and *A. reptans* Mg.:—A few mines of both these species were found in leaves of *Urtica dioica* in Eastern Wood.

Napomyza ilicis Curtis:—Mines in leaves of *Ilex aquifolium* were numerous and widely distributed.

Phytomyza glechomae Kalt.:—Leaf-mines of this species on *Glechoma hederacea* were again found in Eastern Wood.

MUSCIDAE (ANTHOMYIIDAE).

Pegohylemyia jacobaeae Hardy:—Numerous larvae were found in flower-heads of *Senecio erucifolius*.

P. signata Brischke:—Pinnules of *Pteridium aquilinum* rolled by the larvae of this species were found in some numbers in most of the Bracken areas.

Pegomyia dentiens Pand.:—A few larvae of this species were found in stems of *Filipendula ulmaria*, and the flies emerged in April; a few empty puparia were found in another area, 6.vi.51. Not previously recorded.

P. nigritarsis Zett.—Leaf-mines on *Rumex acetosa*, *R. nemorosus*, and other *Rumex* spp., containing the larvae, were found in a number of areas.

Notes on the Hemiptera-Heteroptera of Bookham Common.

By D. LESTON, F.R.E.S.

ANY attempt at an ecological survey of the Bookham Heteroptera would, in the present state of our knowledge, be presumptuous; all that can be offered is a list with some few remarks. In view of the long-term observations possible at a National Trust property it is felt, however, that even this can be useful as a commencement. The author's thanks are given to the following for much aid: E. S. Brown, F. D. Buck, C. P. Castell, W. J. Le Quesne, Haakon Lindberg, L. Parmenter, R. D. Weal, and, in particular, F. J. Coulson. Mr. Coulson's MS list, incorporating as it does records of his own captures and earlier ones by W. J. Ashdown, W. West, and others, provided an invaluable basis for this present study. Roman figures are used to denote month of capture; except where indicated, the nomenclature follows China (1943).

PENTATOMOIDEA.

Podops inuncta (F.) vi.
Neottiglossa pusilla (Gmel.) vi.
Palomena prasina (L.) viii; nymphs ix.
Dolycoris baccarum (L.) viii; nymphs ix.
Piezodorus lituratus (F.) nymphs ix.
Pentatoma rufipes (L.) vii, viii, ix.
Picromerus bidens (L.) vii, viii, ix.
Troilus luridus (F.) iv, vi, ix; nymphs vii, viii.
Acanthosoma haemorrhoidale (L.) vi.
Elasmostethus interstinctus (L.) viii.
Elasmucha grisea (L.) iv, viii.

P. rufipes, Acanthosoma haemorrhoidale, Elasmostethus interstinctus and *Elasmucha grisea* are the characteristic Pentatomids of Birch-Hawthorn woods such as occur at Bookham. *Picromerus bidens* is a predator; it seems to favour the marsh around the I-O-W pond outflow (*Pulicaria dysenterica, Mentha, Myosotis*, etc.). *Troilus luridus*, another predator, favours trees where it is found feeding on caterpillars; as is often the case with predatory species, it is never found in any numbers but, at Bookham, can usually be taken by beating in Central Wood. Koehler (1948), in his excellent biology of this species, remarks on its habits in pine-woods " . . . living on several pine-trees remaining on the top of them. It is found only occasionally on the plant-cover and this is why it is not often seen." Koehler also points out that the bugs are vegetarian in the 1st instar and gregarious, but in the 2nd instar the diet changes to mixed herbivorous and carnivorous and the bugs disperse.

Piezodorus lituratus is always associated with gorse and occurs on the Dwarf Gorse of Eastern Plain. *Palomena prasina*, an ubiquitous species, can be found by sweeping almost anywhere in predominantly grassy areas.

COREIDAE.

Coreus marginatus (L.) ix.
Rhopalus maculatus (Fieb.) viii.
R. subrufus (Gmel.) viii.
R. parumpunctatus Schill. viii.
Myrmus miriformis (Fall.) viii.

M. miriformis is very abundant in the rank grass of Central Plain during early August and often then *in cop.*

BRACHYRHYNCHIDAE.

Aneurus laevis (F.). Taken by Dr. A. M. Easton on 9th September 1949, the specimens, now in Mr. Coulson's collection, have been re-examined and the determination confirmed.

BERYTIDAE.

Berytinus minor (H.-S.) v.
Metatropis rufescens (H.-S.) vii, viii.

M. rufescens is abundant on its food-plant, Enchanter's Nightshade, beside the Common Road in South East Wood and in scattered places throughout Central Wood. The green larvae were found in considerable numbers during June and July. Wagner (1950) has described, from Finland and Sweden, a subspecies found on Twin-flower, *Linnaea borealis* (L.). This Wagner names ssp. *linnaeae*: all the British specimens known to me are of ssp. *rufescens* H.-S. (not Burmeister, as given by Wagner), but as the host-plant of ssp. *linnaeae* occurs in Scotland there is a possibility of this form being found in Britain.

LYGAEIDAE.

Cymus claviculus (Fall.) vii, viii, ix.
C. melanocephalus Fieb. v, vi, vii, viii, ix, x.
C. glandicolor Hahn v, vi, viii.
Kleidocerys resedae (Panz.) iv.
Chilacis typhae (Perris) vii, viii, ix.
Stygnocoris rusticus (Fall.) viii.
S. pedestris (Fall.)
Trapezonotus dispar Stal iv.
Drymus sylvaticus (F.) vi, viii.
Scolopostethus thomsoni Reut. viii, ix.

The Lygaeidae have hardly been worked for at Bookham. *Stygnocoris pedestris*, listed above, was found by West over 50 years ago but has not since been confirmed—it is primarily a chalk species. *C. glandicolor* is very common amidst the *Myosotis*, *Mentha*, *Typha* and *Equisetum* at the east end of I-O-W Pond. *C. claviculus* is found under short grass beside the cindery tracks of Bayfield and Central Plains. *Chilacis typhae* is best taken by bending the tallest plants of *Typha*, found at I-O-W Pond, over a beating tray and tapping the plants smartly.

PIESMIDAE.

Piesma maculata (Lap.) ix.

TINGITIDAE.

Campylosteira verna (Fall.).
Dictyonota strichnocera Fieb. viii.
Derephysia foliacea (Fall.) ix.
Tingis ampliata (H.-S.) iv, v, vi, vii, ix.
T. cardui (L.) ix.
Physatocheila dumetorum (H.-S.) vi, ix, x.
Monanthia humuli (F.) v, vi, viii, ix, x.

The record of *C. verna*, an old one, has not been confirmed. *D. strichnocera* is found on the Dwarf Gorse of Eastern Plain, *Tingis cardui* is abundant on thistle everywhere.

REDUVIIDAE.

Empicoris vagabundus (L.) viii, ix.
E. baerensprungi (Dohrn) vii.

E. vagabundus is common in late summer on lichen-covered and dead branches of *Crataegus*, *Pyrus*, *Prunus*, etc.; it can be obtained in dozens by beating these trees in Central Wood.

NABIDAE.

Nabis ferus (L.) vii, viii, ix.
N. flavomarginatus Scholtz vii, viii, ix.
N. rugosus (L.) viii, ix.
N. mirmicoides Costa vii.
N. apterus (F.) viii, ix.
N. major (Costa) viii.
N. boops (Schiodte) vii.
N. limbatus (Dahlb.) vii, viii, ix.

All but three of our indigenous Nabidae have been found; *N. boops* occurs sparingly in the long grass of Eastern Plain, *N. apterus* is abundant on many species of trees in Central Wood. *N. mirmicoides* Costa = *N. lativentris* Boh. et auctt.

ANTHOCORIDAE.

Temnostethus pusillus (H.-S.) viii, ix.
Anthocoris confusus Reut. iv.
A. nemoralis (F.) iv, vii.
A. nemorum (L.) vii, ix.
Orius majusculus (Reut.) iv, vii, ix.
O. minutus (L.) viii, ix, x.
O. laevigatus (Fieb.) ix, x.
Lyctocoris campestris (F.) viii.

This family has scarcely been worked for and there are undoubtedly more species present.

MIRIDAE.

Although abundantly represented, many more species remain to be collected or identified of this family. The determination of *Psallus* specimens is one of difficulty and a revision of the Palearctic species is needed before accurate naming can be attempted. The grouping followed here is that of Carvalho and Leston (1952) and Leston (1952b).

DERAEOCORINAE.

Deraeocoris lutescens (Schill.) vi, viii, ix, x.
D. ruber (L.) vii, viii.
D. scutellaris (F.) vii.

BRYOCORINAE.

Monalocoris filicis (L.) vii, viii, ix.

ORTHOTYLINAE.

Orthocephalus mutabilis (Fall.) vii, viii (including a macropterous female).
Halticus apterus (L.)
H. luteicollis (Panz.) vii (imagines and larvae), viii.
Pilophorus perplexus Dgl. & Scott vii.
Cyllecoris histrionicus (L.) vi.
Dryophilocoris flavoquadrimaculatus (Deg.) vi.
Blapharidopterus angulatus (Fall.) viii, ix.
Globiceps cruciatus Reut. viii.
Mecomma ambulans vii, viii.
Cyrtorhinus pygmaeus (Zett.) vii, viii.
Orthotylus marginalis Reut. viii.
O. prasinus (Fall.) vii.
Melanotrichus flavosparsus (Sahlb.) viii.
Pachylops bicolor (Dgl. & Scott) vii.
Pseudoloxops coccineus (M.-D.)
Heterotoma merioptera (Scop.) vii, viii.
Malacocoris chlorizans (Panz.) viii, ix.

PHYLINAE.

Dicyphus epilobii Reut. vii, viii, ix, x.
D. stachydis Reut. viii.
D. globulifer (Fall.)
Campyloneura virgula (H.-S.) vii, viii, ix.
Lopus decolor (Fall.) vii, viii.
Oncotylus viridiflavus (Goeze) vii (imagines and nymphs), viii.
Amblytylus affinis Fieb. vii.
Orthonotus rufifrons (Fall.) viii.
Harpocera thoracica (Fall.) v, vi.
Phylus palliceps Fieb. vii.
P. melanocephalus (L.) vii.
P. coryli (L.) vii.
Psallus ambiguus (Fall.) vii.
P. betuleti (Fall.) vii.
P. variabilis (Fall.) vii.
P. roseus (F.) vii, viii, ix.
P. salicellus (M.-D.) vii.
Atractomus mali (M.-D.) vii.
Plagiognathus chrysanthemi (Wolff) vii, viii, ix.
P. arbustorum (F.) vii, viii.

MIRINAE.

Pithanus maerkeli (H.-S.) vi, vii, viii.
Phytocoris tiliae (F.) vii.
P. reuteri Saund. ix, x.
P. ulmi (L.) ix.
P. varipes Boh. vii, viii.
Megacoelum infusum (H.-S.) viii.

Adelphocoris ticinensis (M.-D.) vii, viii.
A. lineolatus (Goeze) vii, viii, ix.
Calocoris ochromelas (Gmel.) v, vi.
Miris striatus (L.) vi.
Stenotus binotatus (F.) vii, viii.
Lygus (*Lygus*) *pabulinus* (L.) vii, viii.
L. (*Exolygus*) *pratensis* f. *maritimus* Wagn. viii, ix, x.
L. (*E.*) *rugulipennis* Popp. (=*pubescens* Reut. et auctt.) ix.
L. (*Orthops*) *campestris* (L.) vi, vii, viii, ix.
L. (*O.*) *kalmi* (L.) vii, ix.
L. (*Neolygus*) *lucorum* (M.-D.) vii, viii.
Polymerus unifasciatus (F.) vii, viii.
P. nigritus (Fall.) vii.
Charagochilus gyllenhali (Fall.) vii, viii.
Liocoris tripustulatus (F.) viii, ix, x.
Capsus ater (L.) vii, viii.
Capsodes gothicus (L.) vii.
Acetropis gimmerthali (Flor) vii, viii.
Stenodema laevigata (L.) vii, viii, ix.
S. calcarata (Fall.) vii, viii, ix.
Notostira erratica (L.) vii, viii, ix.
Megaloceroea linearis (Fuess.) vii.
Trigonotylus ruficornis (Geoff.) vii, viii.
Leptopterna dolobrata (L.) vii.
L. ferrugata (Fall.) vii.

The nomenclature of *Lygus* species used here is discussed by Leston (1952c) whilst other changes are given by Carvalho and Leston (1952).

Many of the Mirids listed have only been taken once or twice; the majority can, however, be grouped into (a) woodland species from Central Wood, (b) marsh species from around I-O-W Pond and Central Ditch, (c) grassland species from Central Plain and (d) miscellaneous species from small habitats scattered around Central Plain.

Woodland species. Oaks support an aundant succession of Mirids; these include *Harpocera thoracica* (May, June); *Calocoris ochromelas* (May, June); *Cyllecoris histrionicus* (June); *Dryophilocoris* (=*Cyllecoris* Brit. auctt.) *flavoquadrimaculatus* (June); *Phylus melanocephalus* and *P. palliceps* (early July); *Psallus variabilis* (late July); *Megacoelum infusum* (August). Other species of the Central Wood include *Psallus ambiguus* on hazel; *Blepharidopterus angulatus* on hazel and birch; *Psallus salicellus* on hazel; *P. betuleti* on birch; *Phylus coryli* on hazel. At the field level *Halticus luteicollis* is found on *Galium* spp. but only, it seems, in the woods; *Charagochilus gyllenhali*, on the other hand, appears to be confined to *Galium* spp. in more open places and beside grasslands.

Marshland species. The very varied vegetation of the area around the I-O-W Ponds supports an interesting fauna. *Psallus roseus* is abundant on the sallows whilst species taken by general sweeping include *Acetropis gimmerthali* and *Adelphocoris ticinensis*, here an abundant species in the marginal and outer marginal areas. Castell (1945) gives a useful flora of the area.

Grassland species. The grassy Central Plain is well watered and the grass-inhabiting species of Stenodemini China can be swept in enormous numbers, including *Stenodema laevigatum*, *S. calcarata*, *Notostira erratica*, *Megaloceroea linearis* and *Trigonotylus ruficornis*. *Stenotus binotatus* is also common here.

Miscellaneous species. Bookham provides a number of marginal or cultivated biotopes which help in enlarging the total of species found. The elm-clump, Station Copse, produces a few species of *Orthotylus* (not yet determined) and its field layer, mostly nettle, *Orthonotus rufifrons*, *Lygus pabulinus* and *Liocoris tripustulatus*. The many clumps of *Galium* present on the edges of the grasslands support *Charagochilus gyllenhali*, *Polymerus nigritus* and, especially in damper spots, *Polymerus unifasciatus*. *Cyrtorhinus pygmaeus* is present in numbers at the base of *Carex* spp. on Central Plain beside the Central Ditch; it is never taken by sweeping and only by careful searching can it be found. The beds of Hairy Willowherb scattered over Bayfield Plain and elsewhere support *Dicyphus epilobii* from July to October and, as pointed out by Butler (1923), the two generations overlap. Leston (1952a) has investigated the life-history of *Oncotylus viridiflavus* at Bookham; the small patches of knapweed beside I-O-W Road and Central Path carry this rather localised species during July and August.

Apart from chalk, salt-marsh, coniferous and maritime species, Bookham will probably be found to have a large part of our indigenous Miridae and to compare favourably (from the collector's standpoint) in this respect with the Rhyncophora—two-fifths of the British list according to Easton (1946).

GERRIDAE.

Gerris odontogaster (Zett.) iv, vii, ix.

G. lacustris (L.) ix.

G. odontogaster is the dominant Gerrid on I-O-W Pond but little search has yet been made of the other waters present.

VELIIDAE.

Microvelia reticulata (Burm.) iv, vii, ix.

A small bug found on the water amongst and around *Potomogeton natans* at I-O-W Pond.

SALDIDAE.

Salda saltatoria (L.) iv, vii, x.

Chartoscirta cincta (H.-S.) iv, v, vii, ix.

Other species are probably present but have not yet been searched for.

AQUATIC HETEROPTERA OF I-O-W POND.

Two visits were made to this pond in 1951 but a striking difference in the volume of water present made a comparative study difficult. A corixid population is probably static between late September and April, i.e., the non-breeding and non-migrating period; during April the water was some four feet higher than in the subsequent September and this indicated an enormous increase in water volume. Consequently the insects were greatly dispersed and this was shown in the much reduced haul, 56 corixids on April 28th against 119 on September 29th. Of course, corixids being creatures of narrow ecological niches, it was not expected that this decrease would be proportional to the volumetric decrease, but additional water would cause both lateral and vertical extension of the potential habitat area available to each species.

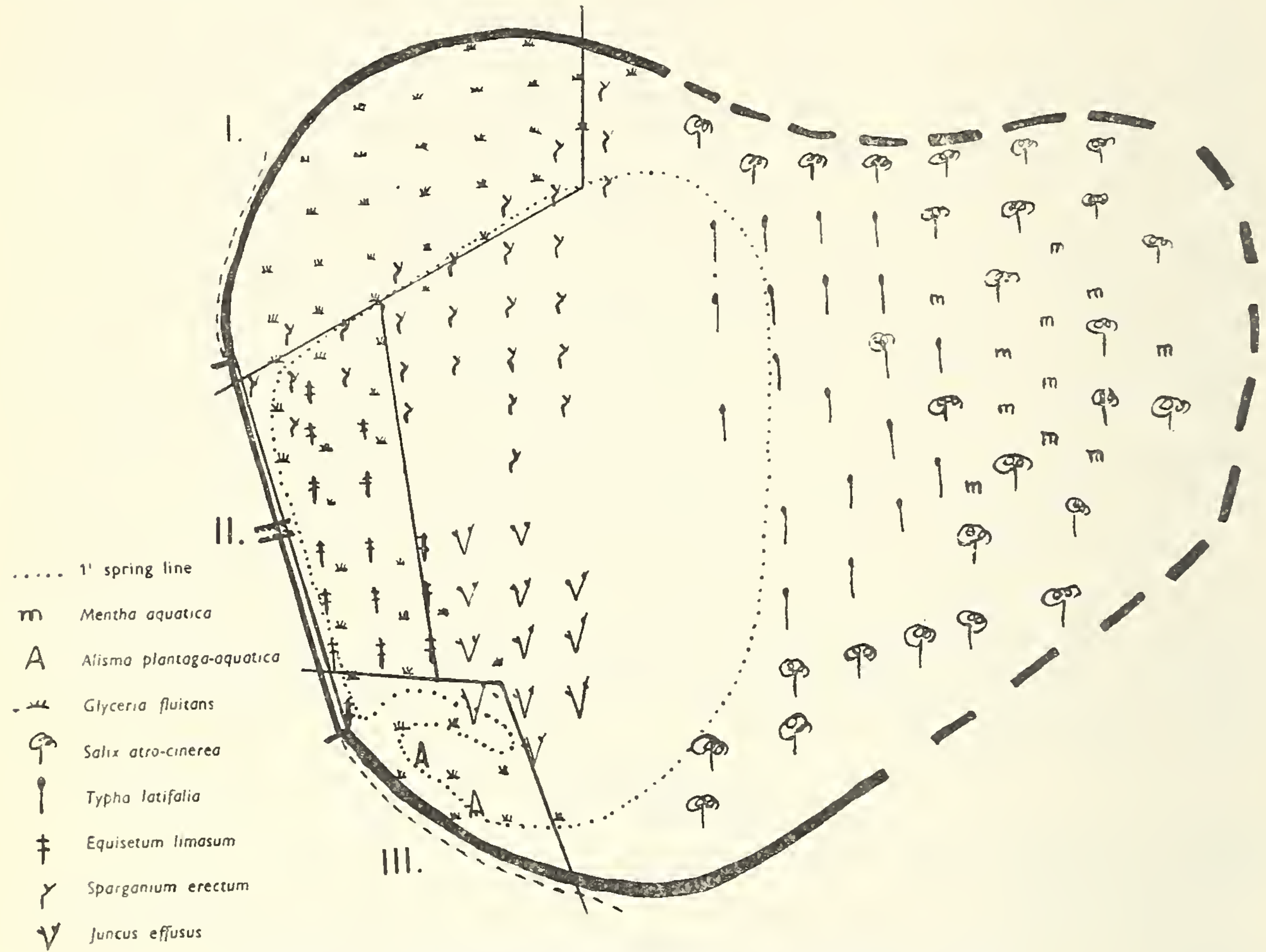

Fig. 1. Vegetation of Isle of Wight Pond.

The London Natural History Society's map shows the position of the pond whilst Steele (1947) has mapped the surrounding vegetation. Castell (1945) describes the pond, its vegetation and the drainage system of which it forms part; it is surrounded and sheltered by woods except on the west and south west and lies on London Clay at an altitude of 115 feet. The maximum area is 3,970 square yards but it would appear that this area is not now approached. Drainage is received from Hollow Ditch on the east; this, and its confluent Woodland Ditch, have traversed London Clay throughout and are largely overhung by oak and birch with bracken. At its western face the pond is enclosed by an embankment and a sluice-gate outlet provided. The embankment has had, according to Bensley (1948) and Castell (1945, 1949, 1950, 1951), a chequered history of repair and disrepair which, coupled with marked fluctuations in the total annual rainfall, have markedly affected the pond's water content; it was practically dry between September 1947 and December 1948. One can thus be certain that the present animal population is not of long standing.

Figure 1 combines observations made during 1951 and should be studied in conjunction with the photograph given by Castell (1951: fig. 1). During April, *Equisetum limosum* was still submerged but *Sparganium erectum* emergent. In September *E. limosum* had passed its maximum development and lay flat on and in the water; at that season the whole area off the embankment face presented a dense mass of *E. limosum* with *Sparganium* dominant at the north end and *Juncus* towards the south. Another September development was the masses of *Lemna trisulca* around A on the map and in patches off the embankment. The *Glyceria* corner retained its nearly pure community almost throughout, but in summer was colonised by some land grasses.

For the purposes of this work the eastern half of the pond was ignored; as it is dry except in mid-winter no comparisons could be made between two catches and so none were attempted. The dotted line indicates where, in April, the depth was approximately one foot. Collecting was carried out by means of a water-net both from the banks and by wading in up to 15 inches of water.

For the April haul the collecting area was divided into three botanical areas thus:—

I. A flat shallow shelf characterised by *Glyceria* with some *Sparganium* present and dense masses of a bryophyte.
II. Dominant plant *E. limosum*; much *Glyceria* present and also *Sparganium* to the north and *Juncus* to the south.
III. Water rather clayey and discoloured; much *Lemna* and a little *Glyceria* and *Juncus*. *Alisma* growing in a few inches of water.

	I		II		III		Total		
Notonecta glauca L.	6		4		1				11
N. obliqua Gall.			1						1
Plea leachi MacG.			1						1
Ilyocoris cimicoides (L.) ...	4		1						5
	♂	♀	♂	♀	♂	♀	♂	♀	
Corixa punctata (*Ill.*)		1	1	4			1	5	= 6
C. sahlbergi (Fieb.)	1	2	2	4			3	6	= 9
C. moesta (Fieb.)	5	7	1	4	1		7	11	= 18
C. lateralis (Leach)			3	6			3	6	= 9
C. praeusta (Fieb.)	1	2	3	3			4	5	= 9
C. distincta (Fieb.)				1				1	= 1
C. concinna (Fieb.)			1				1		= 1
C nigrolineata (Fieb.)				1				1	= 1
C. linnei (Fieb.)		1						1	= 1
C. limitata (Fieb.)				1				1	= 1

TABLE A. Catches of aquatic Heteroptera on April 28th, 1951, at three collecting areas of the Isle of Wight Pond, Bookham Common.

From Table A it is immediately apparent that although rich in species the pond is poor in total numbers; the grand total of 56 corixids compares very unfavourably with catches made for the same time, 1½ hours, on London Clay at Hampstead. The totals of all specimens are given in Table B. It is seen that area III is very impoverished and the corixid fauna negligible whilst the central area, II, is the richest. This coincides with the area of greatest flow. The specimens taken in area I were mostly at its southern margin and amongst *Sparganium*. *Notonecta glauca* advanced further away from the *Sparganium-Equisetum* region than did any corixid. Specimens were few around the actual outflow and in fact almost all were taken amidst *Equisetum* or *Sparganium-Equisetum*. One pair of *C. sahlbergi* were taken *in cop.* whilst a male *C. lateralis* had a Hydrachnid mite attached to the left pala.

	I	II	III
Non-Corixidae	10	7	1
Corixidae	20	35	1
Totals	30	42	2

TABLE B. Total catches at three areas.

For the second collection, made for 1½ hours (as before) on September 29th, no zoning was attempted as it was felt the totals taken would be too small for the application of any analytical techniques and the figures in Table C show that this contention was borne out.

Notonecta glauca	29
N. obliqua	1
Plea leachi	3
Ilyocoris cimicoides	24
Nepa cinerea (L.)	5
Total	62

	♂	♀	
Corixa punctata		7	7
C. sahlbergi	14	24	38
C. linnei	5	8	13
C. moesta	30	24	54
C. distincta	1	1	2
C. praeusta	1	1	2
C. fossarum (Leach)		1	1
C. striata (L.)	1		1
C. falleni (Fieb.)		1	1
Total Corixidae			119

TABLE C. Catches of aquatic Heteroptera on September 29th, 1951, at Isle of Wight Pond, Bookham Common.

C. moesta	45 %
C. sahlbergi	32 %
C. linnei	11 %
C. punctata	6 %
All others %	6 %

TABLE D. Proportions of corixid species as a percentage of the total corixid captures.

From Tables C and D it is clear that the dominant corixid is *C. moesta* and the subdominant *C. sahlbergi*. This was confirmed by the results of the earlier, April, catch but too small a catch then makes this confirmation of doubtful value; there is, though, no doubt that both these species breed here as does *C. linnei*—the proportion of them taken in relation to the whole corixid population is too high for them to be merely migrant species taken in a non-breeding locality. The numbers present of the remaining species are too small for adequate analysis, but this might be due to an unsuitable habitat.

The trio of species, *moesta-sahlbergi-linnei**, has, though not as a trio, been discussed in many ecological papers by Walton, Macan, Popham and Brown and it is instructive to give some of their findings and to try to correlate these with the present pond. Macan (1939) states, of *C. sahlbergi*, " . . . in closed habitats, in thick emergent vegetation . . . woodland pools with the bottom covered with dead leaves "; of *C. linnei*, " . . . often with *sahlbergi* but more frequently in open localities in thick emergent vegetation."

The references in Pearce and Walton (1939), Brown (1943), and Walton (1943) all support Macan's contention, and Walton gives details of a pond, dominated by *C. moesta* and *C. sahlbergi*, which included *Typha*, *Glyceria*, *Potomogeton*, *Juncus*, *Mentha*, *Carex* and *Equisetum*—this pond, in North Somerset, presents a striking parallel to that under review here. Walton concludes his analysis by pointing out that dead leaves, *Callitriche*, *Lemna* and sedges are a prerequisite for *C. sahlbergi* whilst *C. linnei* inhabits similar but more decomposed areas, i.e., with fewer dead leaves present. Brown (1948) found *C. moesta* and *C. sahlbergi* together in Cambridgeshire in a shallow moat on clay with " . . . considerable emergent vegetation . . . floating *Glyceria* . . . " whilst in Hertfordshire he found them in a temporary locality with but little water though thickly vegetated. Popham (1949) concluded, from a study of the Ribble Valley corixids, that the chief difference in optimum habitats between *C. linnei* and *C. sahlbergi* was a preference for the former of a higher % organic matter soluble (i.e., where decomposition of vegetation has proceeded rapidly) and for the latter a lower % o.m.s. (i.e., a slower decomposition rate, many dead leaves and usually clear water above).

Popham (1950) surveyed the pools of the Putney-Richmond-Wimbledon area but failed to find *C. moesta* in any of the large number of pools he examined. In one pond, " bottom lined with dead organic matter, grasses, etc. . . " he found many *C. castanea* (Thoms.) (a species only distinguishable from *C. moesta* with difficulty) and states it occurs over submerged grasses. Now at I-O-W Pond *C. moesta*, at least in April, was most abundant amongst submerged land grasses and *Glyceria*, tending to lessen in numbers as one proceeded away from this habitat; can one assume that in certain circumstances *C. moesta* and

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*This trio comprises three of the four British species of subgenus *Anticorixa* Jacz.; have they diverged morphologically from a common ancestor whilst retaining a similar autecology?

C. castanea fill identical ecological rôles? (The possibility of misidentification cannot wholly be excluded.) It is usually thought that *castanea* is the northern representative of this species-pair, but with isolated pockets in parts of central and southern England. The *sahlbergi-linnei* pair have recently been reported by Popham (1951) in Denbighshire in a pond of " . . . bottom lined with clay and decaying organic matter . . . water clear and fresh "; thus it is certain that they occur together over a wide part of Great Britain, but the records show, especially those for Scotland given by Brown (1948), that *C. sahlbergi* is probably the commoner of the two.

Thus the Isle-of-Wight Pond is a detritus pond, class 9 of Brown's classification (1943), of a south of England pattern on London Clay, characterised by the presence of the corixid trio, *moesta-sahlbergi-linnei*; *C. moesta* is largely confined to submerged grass areas and *Glyceria*, whilst the other two are characteristic of ponds on clay with thick emergent vegetation and, in the case of *sahlbergi*, a low rate of organic decomposition. Popham (1943) has shown that the dark *C. sahlbergi* and *C. linnei* are on the whole more restricted in their colour range than most other British corixids and, in a series of papers, has conclusively demonstrated the tendency of adult corixids to congregate on a matching background; the mechanism is fully discussed by him. The I-O-W. Pond is dark, almost black coloured, at the bottom, except for the lighter clay-coloured south-western corner, and would provide optimum bottom colour for these two species; Popham's theory perhaps explains their absence from the south-west corner.

It has been shown above that the pond has had a mixed history. A recent paper by Brown (1951) concludes that both *C. moesta* and *C. sahlbergi* are readily able to colonise and utilise temporary habitats and, at least in Hertfordshire, occur principally in temporary habitats. He demonstrates the high migration rate of these two species, a factor enabling us to explain their presence here.

It is hoped to continue observations during 1952; the position of *C. punctata* and *C. praeusta* needs investigation, both are here apparently as breeding species. The classification of Table E should provide a basis for future work.

Indigenous species.	Uncertain species.	Non-indigenous species.
C. moesta	*C. fossarum*	*C. concina*
C. sahlbergi	*C. lateralis*	*C. nigrolineata*
C. linnei		*C. limitata*
C. punctata		*C. striata*
C. praeusta		*C. falleni*

TABLE E. Suggested classification of corixids of Isle of Wight Pond, Bookham Common.

Of the species considered as of uncertain status, the locality looks suitable for *C. fossarum*—masses of floating weed with intervening clear patches (a similar situation at Viaduct Pond, Hampstead, also on London Clay, contains only this species and *Notonecta glauca*) whilst the elusive *C. lateralis* appears often to be missed in collecting owing to its wandering habit.

The non-corixid water-bugs present include, in *Notonecta glauca*, *Ilyocoris cimicoides* and *Nepa cinerea* the typical species found abundantly in southern England in ponds on clay with much vegetation and sloping muddy banks. Probably *N. obliqua* is non-indigenous here.

A few other localities were examined for corixids but with the exception of *C. sahlbergi*, found in a bomb-crater pond with dense emergent vegetation, including *Juncus*, at Bayfield Plain, none was apparent.

Appendix.

The following aquatic Coleoptera were found. Easton (1949) has listed the Hydrophilidae and those marked by an asterisk are recorded by him.

I.O.W. Pond, 28.iv.51: *Rantus exsoletus* (Forst.); *Copeplatus agilis* F.; *Noterus capricornis* Herbst; *Hydroporus palustris* (L.); *H. dorsalis* (F.); *Hydrobius fuscipes* (L.)*; *Helochares lividus* (Forst.)*; *Enochrus testaceus* (F.)*; *E. coarctatus* (Gred.)*; *Berosus luridus* (L.); *Anacaena limbata* (F.)*;*Haliplus ruficollis* (Deg.) (all det. E. S. Brown).

I.O.W. Pond, 29.ix.51: *Acilius sulcatus* (L.); *Hygrobia hermanni* (F.); *Dytiscus marginalis* L.; *Hyphydrus ovatus* (L.). (all det. mihi).

Bomb-crater Pond, Bayfield Plain, 28.iv.51: *Hydroporus pubescens* (Gyll.); *Enochrus coarctatus* (Gred.)* (all det. E. S. Brown).

Banks Streams, 22.iv.51: *Agabus chalconatus typica* (Panz.) (det. E. S. Brown).

REFERENCES.

BENSLEY, C. J. F. 1948. Freshwater Mollusca of Bookham Common. *London Naturalist*, **27**, 51-55.

BROWN, E. S. 1943. A contribution towards an ecological survey . . . Anglesey, Caernarvon and Merioneth. *Trans. Soc. Brit., Ent.*, **8**, 169-230.

——, 1948. A contribution towards an ecological survey . . . Scottish Highands and East and South England. *Trans. Soc. Brit. Ent.*, **9**, 151-195.

——, 1951. The relation between migration rate and type of habitat in aquatic insects, with special reference to certain species of Corixidae. *Proc. zool. Soc. Lond.*, **121**, 539-545.

BUTLER, E. A. 1923. *A Biology of the British Hemiptera-Heteroptera*, London.

CARVALHO, J. C. M., & LESTON, D. 1952. The genera of the British Miridae, *Ent. mon. Mag.* (in press).

CASTELL, C. P. 1945. The ponds and their vegetation. *London Naturalist*, **24**, 15-22.

——, 1949. Progress report. *London Naturalist*, **28**, 45-46.

——, 1950. Progress report. *London Naturalist*, **29**, 89-90.

——, 1951. Progress report. *London Naturalist*, **30**, 41-42.

CHINA, W. E. 1943. in *Generic Names of British Insects*, **1** (8), 211-342.

EASTON, A. M. 1946. An annotated list of the Rhynchophora of Bookham Common. *London Naturalist*, **25**, 56-63.

——, 1949. The Coleoptera of Bookham Common. Palpicornia, Lamellicornia. *London Naturalist*, **28**, 59-63.

KOEHLER, W. 1948. Troilus luridus F. (Hem. Het.). *Trav. Inst. polon. Rech. forest*, (A), **51**, 1-80.

LESTON, D. 1952a. Oncotylus viridiflavus Goeze (Hem., Miridae) and its foodplant, Knapweed. *Entomologist*, **85**, 19-21.

——, 1952b. Some records of Netherlands Hemiptera with a generic list of the Miridae. *Ent. Ber. Amst.* (in press).

——, 1952c. Some subgenera of Lygus Hahn (Hem., Miridae) with a review of the British species. *Ent. Gaz.* (in press).

MACAN, T. T. 1939. A key to the British species of Corixidae (Hem., Het.) with notes on their ecology. *Freshw. biol. Assn. British. Emp. Sci. Publ.*, **1**, 1-27.

PEARCE, E. J., & WALTON, G. A. 1939. A contribution towards an ecological survey . . . British Isles. *Trans. Soc. Brit. Ent.*, **6**, 149-180.

POPHAM, E. J., 1943. Ecological studies of the commoner species of British Corixidae. *J. Anim. Ecol.*, **12**, 124-134.

——, 1949. A contribution towards an ecological survey . . . Ribble Valley (Lancashire south and mid). *Trans. Soc. Brit. Ent.*, **10**, 1-44.

——, 1950. Water-bugs (Hem., Het.) of North Surrey. *J. Soc. Brit. Ent.*, **3**, 158-173.

——, 1951. A short contribution towards an ecological survey . . . (Denbighshire and Merionethshire). *Trans. Soc. Brit. Ent.*, **10**, 269-280.

STEELE, B. 1947. Woodland vegetation of Bookham Common. *London Naturalist*, **26**. 82-83.

WAGNER, E. 1950. Metatropis rufescens linnaeae nov. subsp. (Hem. Het. Berytidae). *Opusc. ent.*, **15**, 203-205.

WALTON, G. A. 1943. The water-bugs (Rhynchota-Hemiptera) of North Somerset. *Trans. Soc. Brit. Ent.*, **8**, 231-290.

The Application of the Logarithmic Series and the Index of Diversity to Bird Population Statistics.

By D. G. Tucker, D.Sc.

PREAMBLE.

A NUMBER of years ago the author read a paper (Tucker 1947b) to the Society, discussing several applications of statistical methods to Natural History (and particularly ornithological) research. Among these methods was the 'logarithmic series' and its parameter, the 'Index of Diversity', and it was attempted to show various ways in which this method could be useful in ecological studies. One of the main uses seems to be (as demonstrated in the previous paper) to enable comparisons to be made between habitats and survey areas of very different sizes. But it was also pointed out that no extensive and critical test of whether the basic relationships of the method did really apply to bird populations had been made, although superficially it seemed satisfactory.

The present paper attempts to make this test. It is necessarily almost entirely numerical and possibly, therefore, rather dull. But it does review a large amount of data of bird populations, and does raise some interesting speculations. Moreover it does not entirely prove the validity of the logarithmic series, although the Index of Diversity should still be very useful. Much further research will be necessary, and this is being carried on by the Ecological Section of the Society at Bookham Common; no doubt a further report will be published.

1. *Introduction*

The logarithmic series, first proposed by R. A. Fisher (1943), has by now become well-known through the papers by C. B. Williams (1943-7) who has shown that it can represent, with fair accuracy, the distribution of units in groups in biology. It is not, therefore, proposed to discuss the theory and mathematics of the series in the present paper. However, there has been, in the published work on the subject, a notable lack of discussion of the application of the series to bird populations, and this is no doubt due to a lack of suitable data. It has been the present author's aim, over the last few years, to obtain suitable data, and this paper presents the analysis of these data from the one point of view of the logarithmic series.

The logarithmic series gives the number of groups represented by one, two, three, etc., units in a natural population. In the present case we shall consider only the number of bird species represented by one, two, three, etc., individuals in samples of bird populations. The series is

$$n_1, \frac{n_1 x}{2}, \frac{n_1 x^2}{3}, \frac{n_1 x^3}{4}, \text{ etc.}$$

where n_1 is the number of species represented by one individual, and x is a factor dependent on the sample itself, but always less than unity. If N is the total number of individuals and S is the total number of species in the sample, then

$$\frac{N}{S} = \frac{x}{(1-x)(-\log_e[1-x])}$$

which defines x.

If we define a parameter α as n_1/x, the series becomes

$$\alpha x, \frac{\alpha x^2}{2}, \frac{\alpha x^3}{3}, \frac{\alpha x^4}{4}, \text{ etc.}$$

and it can be shown that α is a constant for any population, irrespective of the size of the sample taken, and it is known as the Index of Diversity,

It can now be seen that if we can show that the logarithmic series applies to bird populations, then the Index of Diversity can be used as a parameter, or characteristic property, of the bird population of any particular habitat. Its use in ecology might then become quite important.

The data analyzed in this paper are of two types:

(a) sample counts of several different populations; for each population a number of similar counts were made over the same route at different times, and the average results are taken; the majority of the counts have been made by the author,

and (b) sample counts of several different woodland habitat types, published by Lack and Venables (1939); in each individual habitat only one count was made,* but the distribution of species and individuals has been averaged (by the present author) over all the counts of each habitat *type*.

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*Actually there were many habitats in which several counts were made, but the results of these were represented in a combined form which was useless for the present purpose. Consequently only those cases where single counts were published have been utilized here.

The first set of data is therefore strictly suitable for testing the logarithmic series, but the second set is not, since the various counts which are averaged are not of the same population, but of different populations in the same habitat type—the various counts are, moreover, of samples of varying size. It is thought that these effects will probably have little influence on the results, as the variations are averaged out; and certainly this seems justified by the results, which are very similar to those obtained from the first set of data.

Particulars of the habitats, and dates and duration of counts, are given for the first set of data in Table 1, and references are given to any published accounts of the habitats and other work on their bird populations. The details of individual counts (i.e. names of species and numbers of birds in each) are not given in this paper as the space required would be so large, but they can be obtained on request from the author.

2. *Fitting the logarithmic series to the data.*

For each series of counts, as set out in Table 1, and for those published by Lack and Venables, as indicated in Table 5, average results of the distribution of individuals in species were obtained by the following method. The total number of occurrences of species represented by only one individual was determined and divided by the number of counts in the series; this then gave the average number of species represented by one individual. The average numbers of species represented by two, three, etc., individuals were determined in a similar way. The results are shown in Table 2, in the columns headed "O" (i.e. "observed"). The logarithmic series corresponding to these results is determined from the average number (N_{AV}) of individuals per count and the average number (S_{AV}) of species per count, in a manner described in Williams' papers; the factor x and the parameter α (Index of Diversity) have to be calculated in order to do this, and are shown for each count in Table 2. The calculated series are shown in the columns headed "C" in Table 2, and it is simple to see by inspection what similarity exists between the observed and calculated series. It must be agreed that the similarity is good. The series of counts designated C1-3 are represented graphically in Fig. 1 to help in the appreciation of the results and the measure of agreement. In many cases the number of birds observed has been insufficient to give a smooth series of observed values, and so some grouping has been done. Generally speaking, the number of species represented by one or two individuals is in tolerable agreement with that calculated.

Table 3 shows the percentage error of the observed numbers over the calculated for the first four rows of Table 2 for those counts which are considered reliable. It is immediately obvious that there is a consistent trend in these errors. The average error over the whole 99 counts has been worked out and is shown also in Table 3. The number of species represented by one or three individuals is below the calculated figure, and the number represented by two or four is above the calculated figure. A possible conclusion from this result is that birds tend to go about in pairs. In this connection it is important to emphasize that the counts are all of samples and not of whole populations. The effect is just as marked in winter as in summer.

It is also worthy of note that the result of Table 3 suggests that the first few terms of the observed series are better fitted by a hyperbolic series ($n_1, \frac{n_1}{2}, \frac{n_1}{3}$, etc.) than by the logarithmic series!

The counts designated F2 and F3 were made in very limited habitats, and the number of birds involved is very small. It is therefore a very good sign that even in these cases a tolerable resemblance between observed and calculated results exists. It is, on the other hand, rather surprising that better agreement is not obtained in the series H1, which involves over 150,000 birds and over 100 hours' observation.

The variable factor of conspicuousness has been ignored in this work; it will affect the results only if it is related to rarity.

3. *The Index of Diversity.*

To enable the significance of the values of the Index of Diversity to be better appreciated, Tables 4 and 5 have been prepared, and it can be seen at once that in all cases where a comparison can be made of the index in winter and in the breeding season, it is considerably higher in the latter. The influence of migration on this comparison would be expected to give a considerably smaller difference than this, and a more likely explanation is that, as a first approximation, for each bird seen on a count in the breeding season, there is another bird on the nest. To test this hypothesis, we can double the average number of individuals, while leaving the number of species unchanged. Ignoring the fact that the logarithmic series no longer properly applies, we can estimate the index of diversity from $2N_{AV}$ and S_{AV}, and these results are shown in brackets in Tables 4 and 5. The agreement now existing between winter and the breeding season (especially in Table 4, where the same individual habitat is involved in both winter and breeding season) is very much closer. This forces us to the conclusion that the basic assumptions on which the theory of the logarithmic series is based, namely, that the sample is randomized by units (or individuals in our case), are not always valid in the case of a bird population, and the randomization may be sometimes in pairs, or divided between units and pairs.

As far as the actual calculated values of index of diversity are related to habitat, it is evident that they are higher in the more mixed habitats. For instance, in mixed woodland and grassland (series A1-4, B1-2, G1-2) the diversity is greater than in simple habitats (series C1-3, D1, F2-3). This result has been predicted in previous papers from theoretical considerations.

But the general consistency of the figures is rather surprising, covering no greater range than 1.6 to 7.5 overall;* although it must be admitted that extreme types of habitat may not have been considered. It would be interesting to know the results for habitats such as mudflats, rocky islands, mountains, the open sea, etc.

4. *Variation from Count to Count and from One Observer to Another.*

Almost all the results discussed so far are averages over a number of counts, and in each series only one observer is concerned. The question naturally arises, to what extent do counts in the same habitat vary among themselves, and to what extent do the results obtained depend on the particular observer? No complete study of these problems has been made, but sample (and, it is thought, typical) results are given in Tables 6-8 and in Fig. 2.

Table 6 shows the actual recorded data of counts made by different observers in the area of series B. These counts were made especially for the comparison now under discussion. In each of the three sets of results the counts were made over exactly the same route at exactly the same time, and with the same duration. In the first and third sets, the author walked in the opposite direction to the other observer(s) so that there should be no mutual influence. In the second set the two observers walked only about 20-30 yards apart and tried not to be influenced by each other. The agreement is in this case as good as might be expected, but in the other cases is rather disappointingly poor. Table 7 shows the distribution of individuals in species for these counts, and it will be seen that the agreement is poor.

Table 8 shows the variations in numbers of individuals and species and in the index of diversity calculated from these numbers for the C series of counts. The variations are considerable. It will be noticed that, in all three sets of results, the average value of the index of diversity obtained this way is higher than that obtained by working out the average distribution as in Table 2. This appears to be a universal result, occurring in all the cases tested, including, for instance, the large series of counts designated H1, where the average index of diversity is 6.02 (maximum value 7.5, minimum 5.1) as compared with 5.90 obtained from the average count. This discrepancy must be due mainly to the logarithmic relationship of the index of diversity to the numbers of individuals and species. The method based on the average count (as used in Table 2) appears to be the correct one.

Figure 2 shows graphically the distribution of values of number of species over the 19 counts of series C. It can clearly be seen that for each number of individuals the number of species varies widely over the series of counts, and no great confidence can be felt in the averages obtained. The smooth curves shown in the figure are the calculated results from Table 2.

*This can be interpreted in terms of the number of species in a given number of individuals thus:—In a sample of 100 birds there would be expected between 6 and 20 species, and in a sample of 1000 birds there would be expected between 10 and 36 species approximately.

What appears to be needed to assess the reliability of the averaged results given in this paper is some means of calculating confidence limits (on a statistical basis of say 95% or 99% reliability) for the index of diversity, and a test of significance to determine whether the difference between the indices of diversity for different series of counts is significant or merely due to random causes.

5. *Conclusions.*

It may be concluded that the logarithmic series does fit observed results for sample counts of bird populations reasonably well, but it is possible that a hyperbolic series might fit better. There is evidence of pairing in the results examined, and, probably mainly on this account, the index of diversity for a given habitat is apparently much greater in the breeding season than in winter. The basis of use of the index (and of the logarithmic series) for sample counts is thus slightly confused, and the effect of pairing requires further investigation.

For ordinary types of British habitat, the index of diversity appears to lie within the range 1.6 to 7.5

Although the variable factor of conspicuousness has not been taken into account, there is no evidence that it seriously affects the results obtained.

The reliability of the results quoted is open to some doubt on account of the great variation in results from one count to another in the same series, and from one observer to another, but in the absence of any suitable statistical test, it is thought the work done at least gives a good general picture of the position, and shows the range with which the index of diversity is likely to fall for ordinary British habitat types.

The author's thanks are due to Dr. C. B. Williams of Rothamsted for reading and criticizing his manuscript, and to Mr L. Parmenter for the use of the Mitcham Common data.

REFERENCES.

CURRIE, P. W. E. (1939). "A Winter Census of the Birds of Limpsfield Common." *London Naturalist* for 1938, p. 79.

EPPING FOREST SURVEY. (1948). "Report on the Survey of the Ludgate Plain Area, 1946-7." *London Naturalist* for 1947, p. 66.

FISHER, R. A. (1943). "A Theoretical Distribution for the Apparent Abundance of Different Species." *J. Anim. Ecol.*, *12*, p. 54.

LACK, D., & VENABLES, L. S. V. (1939). "The Habitat Distribution of British Woodland Birds." *J. Anim. Ecol.*, *8*, p. 39.

LIMPSFIELD COMMON SURVEY (1938-42). See *London Naturalist* for 1937-41.

PARMENTER, L. (1940). "A Second Winter Census of the Birds of Limpsfield Common." *London Naturalist* for 1939, p. 31.

TUCKER, D. G. (1947a). "The Mammals and Birds of Highams Park." *London Naturalist* for 1946, (No. 26), p. 109.

——, (1947b). "Some Simple Quantitative Relationships in Ecology, with particular reference to Birds." *London Naturalist* for 1946, (No. 26), p. 42).

——, (1948). "A Preliminary Quantitative Study of the Birds near Bicker, Parts of Holland." *Trans. Lincs. Nat. Union*, *12*, p. 31.

WILLIAMS, C. B. (1943). "Relations between Numbers of Species and Individuals in Samples:—Results obtained by means of a Light Trap at Rothamsted." *J. Anim. Ecol.*, *12*, p. 44.

——, (1943). "Area and Number of Species." *Nature*, *152*, p. 264.

——, (1944). Some Applications of the Logarithmic Series and the Index of Diversity to Ecological Problems." *J. Ecol.*, *32*, p. 1.

——, (1947). "The Logarithmic Series and its Application to Biological Problems. *J. Ecol.*, *34*, p. 253.

TABLE 1. Index to Main Series of Counts.

Series designation.	Particulars of Habitat.		Particulars of Counts.
A1-4	Highams Park, part of Epping Forest, Essex. Mixed habitat, 18 acres oak-hornbeam wood, 6 acres grass, 6 acres lake. See Tucker (1947a). All counts about 45 mins. duration.	A1.	7 counts in winter under quiet conditions (i.e. less than 20 human beings in area). Dates and times :—11/1/46, 11.30 a.m.; 20/1/46, 8.50 a.m.; 24/1/46, 8 a.m.; 4/2/46, 12.30 p.m.; 16/3/46, 11.40 a.m.; 18/3/46, 10.40 a.m.; 28/3/46, 9 a.m.
		A2.	11 counts in winter under busy conditions (i.e. more than 20 human beings in area). Dates and times :—25/12/45, 11.15 a.m.; 26/12/45, noon; 6/1/46, noon; 6/1/46, 3 p.m.; 12/1/46, 2.45 p.m.; 13/1/46, noon; 13/1/46, 3 p.m.; 19/1/46, 3 p.m.; 10/3/46, 10.30 a.m.; 24/3/46, 11.30 a.m.; 28/3/46, 2.20 p.m.
		A3.	3 counts in spring under quiet conditions. Dates and times :—2/5/46, 7 a.m.; 19/5/46, 10.20 a.m.; 7/6/46, 8.30 a.m.
		A4.	7 counts in spring under busy conditions. Dates and times :—7/4/46, 11 a.m.; 7/4/46, 3 p.m.; 14/4/46, 10.30 a.m.; 5/5/46, 11.45 a.m.; 19/5/46, 2.30 p.m.; 11/6/46, 2.20 p.m.; 23/6/46, 10.30 a.m.
B1-2	Ludgate Plain (Epping Forest, Essex). Mixed habitat, about 20 acres oak-hornbeam wood with beech, holly, rose and blackthorn, and about 3 acres marshy grass. See Epping Forest Survey (1948). All counts about 50 mins. duration.	B1.	10 counts made by Mr. A. C. Wheeler. Dates and times :—28/4/46, 10.40 a.m.; 30/6/46, 9.30 a.m.; 28/7/46, 9.30 a.m.; 28/7/46, 10.20 a.m.; 2/8/46, 8.45 a.m.; 4/8/46, 7.15 a.m.: 12/8/46, 8.10 a.m.; 8/9/46, 9 a.m.; 27/9/46, 8.30 a.m.; 29/9/46, 9 a.m.
		B2.	5 counts made by author. Dates and times :—28/4/46, 9.40 a.m.; 28/4/46, 10.40 a.m.; 26/5/46, 9.40 a.m.; 2/6/46, 11 a.m.; 30/6/46, 9.30 a.m.
C1-3	Bicker (Parts of Holland, Lincs). Agricultural land, mainly arable, with a few small grass-fields and a few farmhouses and cottages; hedgerows along the roads, and a few large trees. See Tucker (1948). Counts about 25 mins. duration.	C1.	9 counts in summer along a public road. Dates and times :—7/6/46 3.30 p.m.; 7/6/46, 4 p.m.; 8/6/46, 9 a.m.; 8/6/46, 9.30 a.m.; 11/6/46, 9 a.m.; 11/6/46, 9.30 a.m.; 6/8/46, 9 a.m.; 6/8/46, 9.30 a.m.; 8/8/46, 9 a.m.
		C2.	4 counts in winter along the same route. Dates and times :—24/12/46, 10.40 a.m.; 25/12/46, 11 a.m.; 25/3/47, 9.50 a.m.; 25/3/47, 10.15 a.m.

Series designation.	Particulars of Habitat.	Particulars of Counts.
		C3. 6 counts in summer along a route entirely in fields, no houses or trees, some hedgerows. Dates and times:—12/6/46, 9 a.m.; 4/8/46, 12.30 p.m.; 5/8/46, 8.15 a.m.; 9/8/46, 8 a.m.; 29/5/47, 10.15 a.m.; 30/5/47, 10.15 a.m.
D1	River Welland saltings (Lincs.). Entirely salt-marsh except for one small cottage. Count 30 mins. duration.	D1. 1 count on 6/8/46, 5.30 p.m.
E1	Burnham-on-Crouch (Essex). Walk along river-wall, mainly pasture and marsh on land side. Count 45 mins. duration.	E1. 1 count on 17/6/46, 1 p.m.
F1-3	Amersham (Bucks.). Mainly arable land, some grass, small mixed woods and hedgerows. Duration of counts, 15 mins. for F1, 10 mins. for F2-3.	F1. 7 counts in wood and along a hedgerow. F2. 7 counts in a large field, no hedges (soil ploughed). F3. 7 counts along a tall, thick hedge. One count of each type done on 15/2/48, noon; 21/2/48, 3 p.m.; 28/2/48, 3.30 p.m.; 7/3/48, 11 a.m.; 26/3/48, 10.30 a.m.; 27/3/48, 11.20 a.m.; 4/4/48, 11.40 a.m.
G1-2	Limpsfield Common (Surrey). Dry, heathy land at 500 ft. elevation, with bracken, grass, heather, etc, and some woodland. See Limpsfield Common Survey (1938-1942).	G1. Complete winter census, 4/12/38, 10.30 a.m.-4 p.m. See Currie (1939). G. Complete winter census, 3/12/39, 10.45 a.m.-1 p.m. See Parmenter (1940).
H1	Mitcham Common (Surrey). Open land, route including Beddington Sewage Farm. Total mileage of route, 3½ miles. All counts about 3½ hours duration, and made by Mr. L. Parmenter.	H1. 30 counts in winter, all between about 9 a.m. and 1 p.m. Dates:—15/2/31, 1/3/31, 8/3/31, 15/3/31, 18/10/31, 1/11/31, 22/11/31, 20/12/31, 25/12/31, 17/1/32, 14/2/32, 20/3/32, 2/10/32, 6/11/32, 4/12/32, 15/1/33, 29/1/33, 5/3/33, 19/11/33, 21/1/34, 4/3/34, 4/11/34, 20/1/35, 3/2/35, 3/3/35, 10/3/35, 13/10/35, 4/10/36, 29/11/36, 17/1/37.

TABLE 2. Distribution of Individuals in Species.

No. of Individuals in Species	A1		A2		A3		A4		B1		B2		C1		C2		C3	
	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C
1	2.7	3.57	2.45	3.16	4.7	5.76	3.86	4.09	4.3	6.6	5.4	5.1	4.11	4.0	3.0	3.15	2.5	3.5
2	1.7	1.73	1.55	1.52	2.3	2.59	2.28	1.90	3.4	2.9	2.6	2.32	2.33	1.84	1.25	1.51	2.0	1.58
3	1.57	1.12	0.64	0.97	1.3	1.55	0.86	1.18	2.4	1.7	1.4	1.40	1.11	1.14	1.0	0.96	0.83	0.95
4	1.14	0.81	0.55	0.70	1.3	1.05	0.86	0.82	1.5	1.12	0.8	0.96	1.11	0.79	1.5	0.55	0.83	0.64
5	0.29	0.63	1.1	0.54	1.7	0.75	0.43	0.61	1.3	0.79	0.2	0.70	1.11	0.58	1.25		0.67	
6	0.29	0.50	0.55	0.43	0.3	0.57	0.57	0.47	0.6	0.58	0.2	0.53	0.33	0.45	0.75		0.5	
7	0.14	0.42	0.45	0.36	0.6	0.44	0.57	0.38	0.4	0.44	0.4	0.41	0.11	0.36	0		0.33	
8	0.29	0.37	0.55	0.30	0	0.34	0.43	0.31	0.5	0.34	0.4	0.33	0	0.29	0.25		0	
9					0.6	0.28	0.57	0.25	0.1	0.26	0.4	0.26	0.11	0.24	0		0.17	
10					0	0.22	0	0.21	0.3	0.21	0.2	0.21	0	0.20	0	0.21	0.17	0.14
1 and 2							6.14	5.99										
3 and 4																		
1,2 and 3	6.0	6.42							10.1	11.2	9.4	8.8	7.55	6.98	5.25	5.62		
N_{AV}	107.6		79.4		57		59.6		55.1		56.6		53.5		71		36.8	
S_{AV}	12.71		10.64		14.7		11.9		15.5		13.2		11.67		10.5		8.83	
x	0.967		0.960		0.90		0.93		0.88		0.909		0.926		0.955		0.904	
α	3.7		3.3		6.4		4.4		7.5		5.6		4.3		3.3		3.9	

O=observed. C=calculated log series. N_{AV} =average no. of individuals per count. S_{AV} =do. species. α=index of diversity. Numbers in all columns except first are the average numbers of species represented by the given number of individuals.

TABLE 2 (*continued*).

No. of Individuals in Species	D1		E1		F1		F2		F3		G1		G2		H1	
	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C
1	2	4.28	10	6.25	4.0	3.45	1.0	1.29	1.0	1.82	6	6.77	6	6.9	4.7	5.90
2	3	2.08	1	2.91	2.0	1.46	1.0	0.51	1.57	0.64	4	3.32	1	3.35	3.93	2.95
3	1	1.36	2	1.81	0.14	0.82	0.28	0.27	0.43	0.30	2	2.17	1	2.2	2.07	1.97
4	2	0.48	2	1.26	0.43	0.52	0.14		0.14	0.15	0	1.60	4	1.6	2.3	1.47
5	0	0.76	1	0.94	0.14	0.35	0		0		0	1.26	2	1.25	1.17	1.18
6	2	0.62	0		0.14	0.25	0		0		1	1.03	0		1.7	0.98
7	0	0.51	1		0.28	0.18	0		0		1	0.87	0		1.07	0.84
8	0	0.44	0		0		0		0		0	0.74	0		1.17	0.74
9	0	0.38	0		0		0		0		1	0.65	4		0.83	0,66
10	0	0.33	0		0.14		0		0		0	0.57	0		1.4	0.59
1 and 2	5	6.36	11	9.16			2.0	1.80	2.57	2.46	10	10.09			8.63	8.85
3 and 4	3	2.34														
1,2 and 3					6.14	5.73									10.70	10.82
N_{AV}	156		92		22.4		6.14		6.0		385		328		5729	
S_{AV}	16		18		7.56		2.57		3.14		28		27		40.77	
x	0.972		0.932		0.845		0.79		0.70		0.982		0.980		0.99897	
α	4.4		6.7		4.1		1.63		2.6		6.9		7.0		5.9	

TABLE 2 (*continued*).

No. of Individuals in Species.	L1W		L1B		L2W		L2B		L3W		L3B		L4W		L4B		L5W		L5B	
	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C
1	3.72	4.47	4.08	5.17	2.43	2.32	5.43	5.84	2.25	2.50	3.0	3.19	2.4	2.26	4.55	4.52	1.16	1.56	3.54	3.66
2	2.48	2.08	3.28	2.32	1.57	1.12	2.86	2.54	1.0	1.20	1.89	1.42	1.4	1.04	1.64	1.99	0.5	0.76	1.38	1.65
3	1.32	1.29	1.44	1.39	0.29	0.73	1.14	1.47	0.75	0.76	0.77	0.84	0.65	0.63	1.27	1.17	0.5	0.50	0.85	0.98
4	0.96	0.91	1.44	0.43	0.71	0.52	1.57	0.96	0.25	0.54	0.55	0.57	0.65	0.44	0.91	0.77	1.0	0.36	1.08	0.66
5	0.76	0.68	0.68	0.67	0.29	0.40	0.57	0.67	0.75	0.42	0.22	0.40	0.25	0.32	0.64	0.55	0.17	0.28	0.62	0.48
6	0.44	0.52	0.64	0.50	0.57	0.32	0.43	0.49	0.25	0.33	0.33	0.30	0.1	0.24	0.36	0.40	0.17	0.23	0.39	0.36
7	0.76	0.42	0.64	0.38	0.86	0.27	0.43	0.36	0.75	0.27	0.22	0.23	0.1	0.195	0.27	0.30	0	0.20	0.15	0.27
8	0.36	0.34	0.16	0.30	0.14	0.23	0.29	0.27	0.25	0.23	0	0.18	0.05	0.15	0.18	0.23	0.33	0.17	0.23	0.22
9	0.08	0.28																		
10	0.12	0.24																		
1 and 2	6.20	6.55	7.36	7.49	4.29	4.17	8.29	8.38	3.25	3.7	4.89	4.61	3.8	3.3	6.19	6.51	1.66	2.32	4.92	5.31
3 and 4																				
1,2 and 3																				
N_{AV}	65		50.2		67.9		44.9		57.25		29.8		26.95		38.3		66.7		35.9	
S_{AV}	12.64		13.12		8.14		13.4		8.25		7.88		6.15		10.8		6.0		9.23	
x	0.932		0.897		0.966		0.87		0.956		0.893		0.916		0.882		0.977		0.898	
α	4.8		5.77		2.4		6.71		2.62		3.57		2.47		5.13		1.6		4.08	

TABLE 3.

Percentage Errors between Calculated and Observed Numbers of Species.

Series	No. of Counts	% error for 1, 2, 3 or 4 individuals per species			
		1	2	3	4
A1	7	-24	0	+40	+40
A2	11	-22	0	-30	-21
A3	3	-18	-11	-16	+24
A4	7	-5	+20	-27	+5
B1	10	-35	+17	+41	+34
B2	5	+6	+12	0	-17
C1	9	+3	+26	-3	+40
C2	4	-5	-17	+4	+180
C3	6	-28	+26	-12	+29
F1	7	+16	+37	-82	-17
H1	30	-20	+33	+5	+56
AVERAGE ERROR FOR 99 COUNTS		-15.8	+19.3	-3.8	+32.6

TABLE 4.

Index of Diversity for Main Series of Counts.

Locality	Series	Date	No. of Counts	Index of Diversity
Highams Park,	Winter, Quiet	1945-6	7	3.7
(Epping Forest)	Winter, Busy	1945-6	11	3.3
	Spring, Quiet	1946	3	6.4 (4.5)*
	Spring, Busy	1946	7	4.4 (3.3)*
Ludgate Plain	Counts by A.C.W.	1946	10	7.5
(Epping Forest)	Counts by D.G.T.	1946	5	5.6
Bicker,	Road, Summer	1946	9	4.3 (3.3)*
(Holland, Lincs.)	Road, Winter	1946-7	4	3.3
	Fields, Summer	1946,7	6	3.9
River Welland	Saltings	Aug. 1946	1	4.4
Burnham-on-Crouch	River bank	June 1946	1	6.7
Amersham (Bucks.)	Wood + hedges	Winter 1948	7	4.1
	Fields	"	7	1.6
	Hedgerow	"	7	2.6
Limpsfield Common	Winter Censuses	1938	1	6.9
(Surrey)		1939	1	7.0
Mitcham Common	Winter Counts	1931-7	30	5.9

*Values obtained when average no. of birds in count is doubled, but average no. of species is unchanged.

TABLE 5.

Index of Diversity from Published Counts.

Designation	Habitat	Winter or Breeding Season	No. of Counts	Index of Diversity
L1	Oakwoods	W	25	4.8
		B	25	5.8 (4.1)*
L2	Beechwoods (with secondary growth)	W	7	2.4
		B	7	6.7 (4.4)*
L3	Beechwoods (no secondary growth)	W	4	2.6
		B	9	3.6 (2.45)*
L4	Scots Pine (England)	W	20	2.5
		B	11	5.1 (3.4)*
L5	Scots Pine (Scotland)	W	6	1.6
		B	13	4.1 (2.8)*

*Values obtained when average no. of birds in count is doubled, but average no. of species is unchanged.

TABLE 6.

Comparison of Counts by Different Observers.

Check-list Number	Name of Species	Numbers observed on dates shown by observers indicated by initials						
		28/4/46		2/6/46		30/6/46		
		DGT	ACW	DGT	GB	DGT	PR	ACW
3	Crow	3	3	1	-	11	1	1
5	Jackdaw	-	-	-	2	4	4	2
11	Jay	2	-	1	-	2	2	4
14	Starling	4	-	41	46	-	-	-
19	Greenfinch	1	2	-	-	-	-	2
41	Chaffinch	3	6	7	5	-	6	5
61	House-sparrow	-	-	-	-	-	2	2
75	Tree Pipit	-	1	-	-	-	-	-
93	Tree Creeper	-	1	-	-	-	-	-
96	Nuthatch	-	-	-	-	-	-	1
98	Great Tit	10	5	3	3	21	16	18
100	Blue Tit	1	5	8	7	3	5	4
102	Coal Tit	-	-	-	-	2	-	1
107	Marsh Tit	1	1	-	-	-	2	2
129	Chiffchaff	-	-	1	1	-	1	-
132	Willow-warbler	1	3	2	2	2	3	4
162	Blackcap	-	-	1	1	-	-	-
163	Whitethroat	3	2	2	4	-	1	-
174	Mistle-Thrush	-	-	2	2	-	-	-
175	Song-Thrush	1	1	-	-	-	3	-
184	Blackbird	4	5	6	5	9	9	7
201	Redstart	-	-	-	-	-	-	3
203	Nightingale	-	2	-	-	-	-	-
208	Robin	-	2	-	3	3	6	2
211	Hedge-sparrow	-	-	-	-	-	1	-
213	Wren	-	1	1	-	2	6	5
225	Swift	-	-	1	-	-	-	-
235	Green Woodpecker	-	-	-	-	1	1	2
237	Great Spotted Woodpecker	-	-	-	-	1	2	2
380	Woodpigeon	1	1	-	-	22	-	1
383	Turtle-Dove	-	-	-	4	-	-	-

TABLE 7.

Distributions by Different Observers.

Number of Individuals	Number of species on dates shown						
	28/4/46		2/6/46		30/6/46		
	DGT	ACW	DGT	GB	DGT	PR	ACW
1	6	6	6	2	2	5	4
2	1	4	3	3	4	4	7
3	3	2	1	2	2	2	1
4	2	0	0	2	1	1	3
5	0	3	0	2	0	1	2
6	0	1	1	0	0	3	0
7	0	0	1	1	0	0	1
8	0	0	1	0	0	0	0
Total species	13	16	14	13	13	18	19
Total Individuals	35	41	77	85	83	71	68

TABLE 8.

Variation Among Counts. Series C.

(A) Series C1.

Number of Individuals	45	53	41	53	41	59	49	57	84
Number of Species	13	13	13	12	10	13	11	10	10
Index of Diversity (α)	6.4	5.8	6.8	4.9	4.2	5.2	4.4	3.5	2.9

Average $\alpha = 4.90$ (α from average count$=4.3$).

(B) Series C2.

Number of Individuals	114	40	70	60
Number of Species	13	6	12	11
Index of Diversity (α)	3.7	1.9	4.2	3.9

Average $\alpha = 3.43$ (α from average count$=3.3$).

(C) Series C3.

Number of Individuals	34	28	11	73	31	44
Number of Species	10	7	6	12	9	9
Index of Diversity (α)	5.1	3.0	5.4	4.1	4.4	3.4

Average $\alpha = 4.23$ (α from average count$=3.9$).

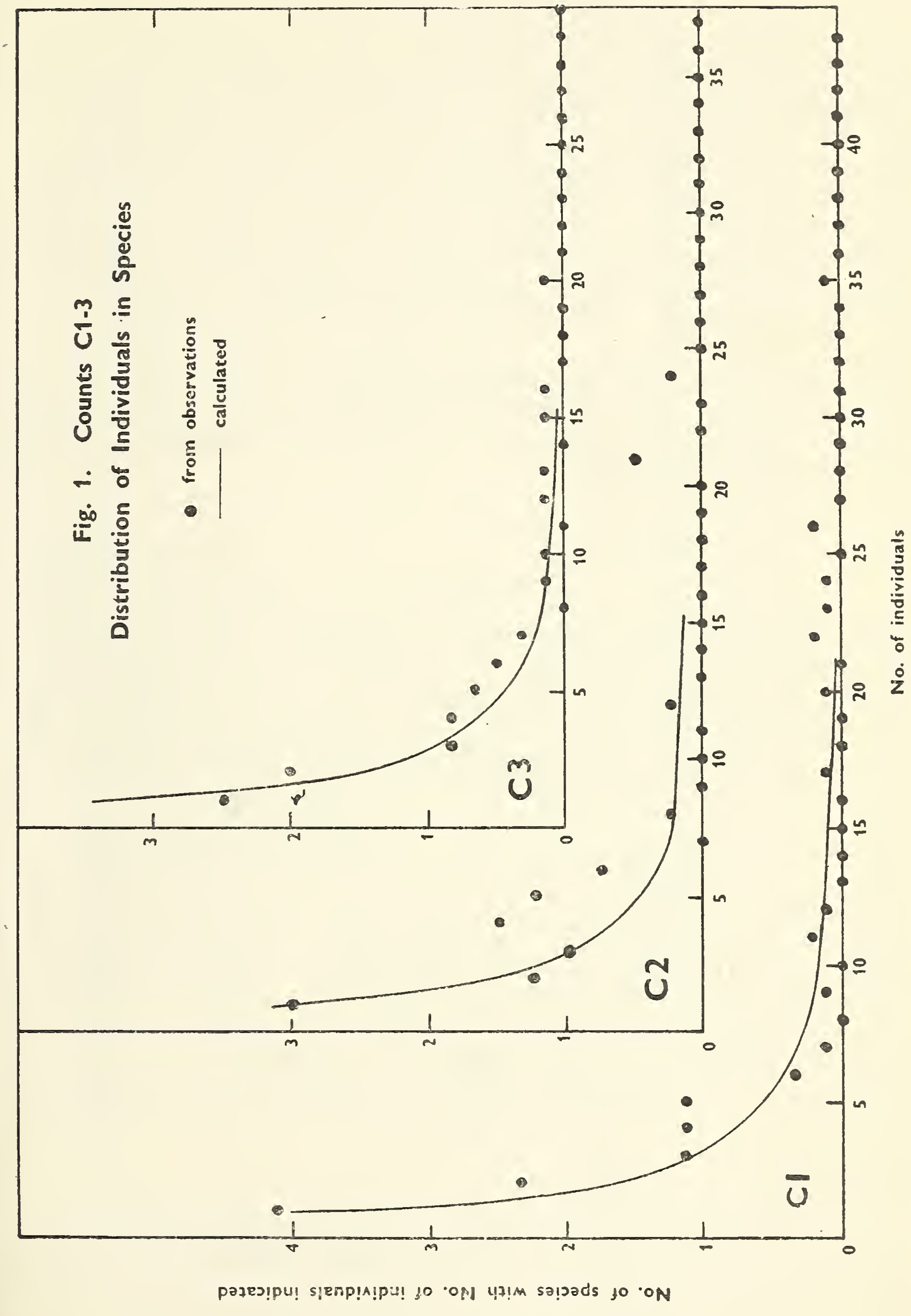
Fig. 1. Counts C1-3
Distribution of Individuals in Species

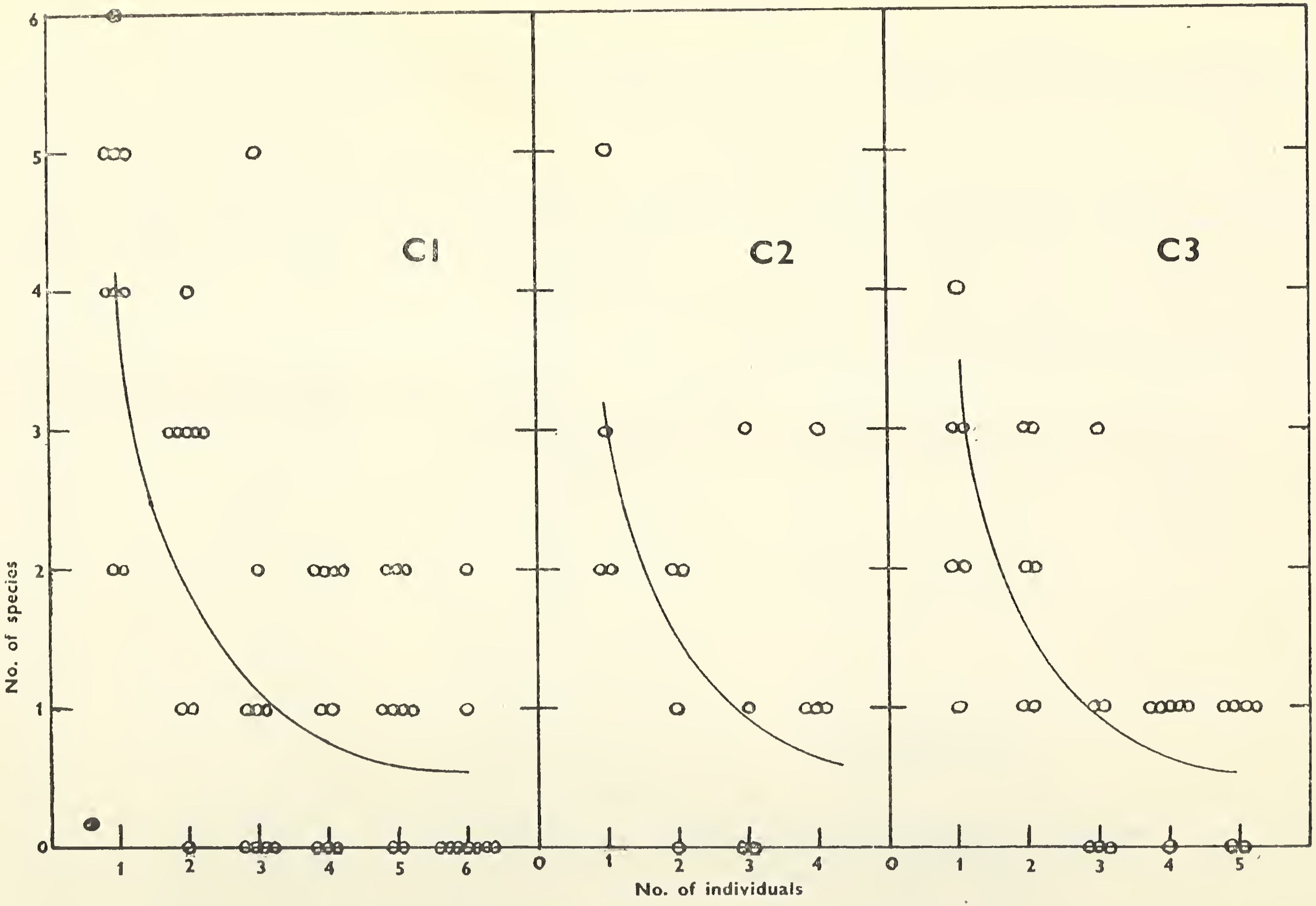

FIG. 2. Counts C1-3. Variation among Counts

Reports on Temporary Geological Sections in the Society's Area.

During 1951 many temporary sections were examined but only three reports were ready for inclusion in this volume. It is gratifying to record an increase in assistance, both from within and outside the Society, but the area is still far from adequately covered and further helpers are urgently needed for this important work. Notification of excavations should be sent to the Secretary for Temporary Sections giving details of the position of the site and stating whether the observer is willing to undertake investigation. This is important in order to avoid duplication. Completed reports should be sent to the Recorder for Temporary Sections.

The help and encouragement received from site owners and their agents is greatly appreciated and the thanks of the Society are again offered to everyone concerned.

M. Ainsley (Recorder).

LONDON W.C.

L.N.H.S./T.S./47/51. London W.C.1.

High Holborn. Just north of High Holborn at the junction of Red Lion Street and Eagle Street. During excavations for building foundations in the early summer of 1951, at a point opposite No. 45, Eagle Street, the following section was observed. Measurements from old building level (approx. pavement level).

(3) Made Ground	3 ft.
(2) Clayey Sand	4 ft. 6 in.
(1) Coarse Gravel	4 ft. +

The above section was at right angles to Eagle Street and at the western end of the site. About the centre of the section a buried channel was observed approximately 36 ft. in width and apparently running in an east-west direction. The northern edge of the channel was 25 ft. from the pavement. The filling of the channel, besides containing material indistinguishable from beds (2) and (1) of the above section, also contained two lenticles of fine yellow sand both up to 1 ft. 3 in. in thickness.

B. Ainsley.

BUCKINGHAMSHIRE.

L.N.H.S./T.S./48/51. Denham, Bucks. 6 inch 53 N.E. and 54 N.W.

Excavations in Willett's Lane, ⅝ of a mile south of Denham, have exposed 2 to 3 ft. of coarse gravel. The deposit consists mainly of angular flint. Other ingredients (identified by Mrs. J. E. Morey) include pebbles of quartzite or vein quartz, tourmalinised siltstone, chert and quartzitic sandstone, all of which appear to be derived from Bunter Pebbles. Pockets of brown loam were also observed in the matrix of brown clay.

This deposit, which is equivalent to the gravel formerly exposed in the now defunct Mansion Lane Pit, probably belongs to the Iver Stage of King and Oakley.

E. **Evans** (Geologists' Association).

MIDDLESEX.

L.N.H.S./T.S./49/51. **Park Lodge Farm Pit, Harefield, Middlesex.** G.R.506.189.

This pit lies immediately to the north of the site of the New Year's Green Pit, Harefield. A section in this pit south of the entrance road and east of the Harefield to New Year's Green road shows the following features, all in Reading Beds:—

Mottled Clays (typical Reading Bed feature in this area)	about 6 ft.
White to Buff Sand	about 13/14 ft.
Band of Bright Red Sand	3 ins.
Clay	3 ins.
Band of Bright Red Sand	3 ins.
Buff Sands	15 ft.
(This buff sand contains in places a semi-consolidated band about 3 ins. thick)	
Greenish Sand . . . to base of pit	Unknown thickness.

The New Year's Green Pit was recommended as a Controlled Section (Ref. G.16) Category A, for preservation in the Nature Conservation Report of 1947. Unfortunately the New Year's Green Pit is being rapidly filled in as a rubbish dump but the Park Lodge Farm Pit seems to show many features of the Reading Beds which were shown in the New Year's Green Pit. This relatively new pit, however, is being rapidly quarried away for sand and is unlikely to be available for inspection for very long.

R. E. **Butler.**

CORRIGENDA: *London Naturalist*, No. 30.

L.N.H.S./T.S./6/49 (part 2), page 31, line 28, for "Suffrain" read "Suffrian."

L.N.H.S./T.S./21/50, page 35, line 13, for "(Montford)" read "(Montfort)."

City Bombed Sites Survey.

Progress Report.

WORK on the Cripplegate bombed sites continued steadily in 1951. It has to be admitted that the experiment of reducing the number of advertised meetings, although it enabled the organisers to devote more time to their own special studies, did not produce any considerable number of new helpers. Nevertheless, as the following papers show, a good deal of work was done and many subjects for future study were revealed. It is hoped that some of these will attract new observers in 1952 and that the scope of the work may be extended to cover some of the many fields which have so far been neglected.

Mollusca on the City Bombed Sites.

By Lt.-Col. C. J. F. Bensley.

Two visits were paid to the area in 1951, and the opportunity was taken to search for mollusca. Very few species were found, and even these were restricted to certain confined areas. It may be that the soot and dust characteristic of the bombed sites render them an unsuitable habitat for mollusca, and that the many vertical walls form effective barriers to prevent the spread even of those species which are present. It is interesting to note that the areas in which mollusca other than *Helix aspersa* were found are both old gardens, in which the mollusca may well have persisted as relicts for a considerable period.

The first of these areas is in the ruins of Girdlers' Hall, east of Aldermanbury. This is an old garden, containing the stump of an ancient fig tree, and surrounded by such high walls that the sun can seldom penetrate. In consequence it is probably damper and cooler than any comparable site in the area. The species found here were as follows:—

Oxychilus cellarius (Müller)—abundant under loose bricks and stones, where there were also many empty shells. This species, as its name implies, shows a liking for human habitations. It has been recorded as a fossil from London Wall.

Retinella nitidula (Draparnaud)—one under a stone. This species shows a preference for animal food, and is said to eat the eggs of slugs. It has been recorded as a fossil from many places in London.

Milax sowerbii (Férrusac)—one under a brick. This is not a particularly common species, but is mentioned by several old writers as being found in London. It is a garden slug, of largely subterranean habits.

Arion hortensis Férrusac—several under stones; the commonest of all garden slugs.

In the second area, the garden of St. Giles' Cripplegate, only a few specimens of *O. cellarius* were found.

The status of *Helix aspersa* Müller, the common garden snail, calls for special mention. The first record is of a single specimen seen in an area between London Wall and Fore Street, east of Basinghall Street, on 9th April 1949, where one was also seen in August of that year. In 1951, they were found to be extraordinarily abundant in this restricted area, as many as 20 being clustered under one stone. Several small piles of broken and empty, but fresh, shells were found; there are no song thrushes in the area, and it is possible that rats may have been responsible. This area is bounded on three sides by a low wall and roads, and on the fourth side by a high building. So far as has been ascertained the snails have not crossed these boundaries. No tracks have even been seen on the walls.

The other area where the species has been observed is in the extreme north, in the corner of Type Court and Milton Street, east of Whitbread's Brewery. This colony is much smaller, though still comprising several hundreds, and is very restricted in extent. The basements in this corner cover a considerable area and communicate with one another by level passages. There seems therefore to be no reason why the colony should not spread. There is obviously scope here for further study, for example by marking individual snails with spots of cellulose paint and so tracing their movements.

The Lepidoptera of Cripplegate.

By D. F. Owen.

This paper is intended only as a preliminary survey of certain of the larger moths found on the bombed sites, and includes a list of lepidoptera recorded to date. The number of species is small, probably as night collecting has not been carried out, for recently twenty-two moths have been noted at light in Thurloe Square, South Kensington (Lanktree 1951). Twelve of these have not been seen at Cripplegate.

The upper soil layer and its associated flora is on the whole favourable to lepidoptera, especially to those whose pupae are affected by the excessive damp common to heavier soils during winter. One of the more spectacular characteristics is the rapid increase of certain species once well established, generally followed by a comparatively slower decline in numbers. This is probably an effect of parasitization by hymenoptera and diptera, for presumably the first few seasons in an entirely new habitat such as this would be free from these parasites. If a graph were drawn, we would find the line representing the increase of the host followed upwards by the line of its parasite, then, after reaching a peak, the parasite would be in sufficient quantity to bring the species down to a more normal level. Presumably, this is the most important biotic factor at Cripplegate, but these remarks are purely theoretical.

Predation by birds appears negligible, though it is important to bear in mind that the more common a larva becomes, the more birds habitually search for it and in consequence a somewhat higher proportion is taken. Starlings feed almost exclusively about the roots of *Senecio*, *Epilobium*, etc., and in the shallow humus they must find numbers of noctuid larvae, together with other invertebrates (Currie 1950). Other records of birds as predators of Cripplegate lepidoptera will be found under the relevant species. Few other animals seem to prey on the bombed site lepidoptera. Individual species are subject to annual fluctuations recorded elsewhere, usually due to climatic conditions. It is interesting to speculate as to the method of arrival of various butterflies and moths in the first place. Quite obviously some have merely spread in from suburban and even City gardens, increasing under the exceptionally favourable conditions to which reference has already been made. Others, such as *C. jacobaeae*, were probably wind-borne. Strong-flying insects could presumably pass over London unrecorded, for it is usually in larval form that these are noted.

Thanks are due to Messrs. P. W. E. Currie, L. Parmenter, J. F. Burton, A. S. Wheeler and my brother, J. E. Owen, for supplying records and helpful suggestions.

Butterflies.

Little work has been done on the butterflies. In periodicals such as the *Entomologist* will be found numerous reports of certain species in central London. The following have been recorded at Cripplegate:—

Wall Brown	*Pararge megera* L.
Comma	*Polygonia c-album* L.
Small Tortoiseshell	*Aglais urticae* L.
Peacock	*Nymphalis io* L.
Painted Lady	*Vanessa cardui* L.
Red Admiral	*V. atalanta* L.
Small Copper	*Lycaena phlaeas* L.
Holly Blue	*Celastrina argiolus* L.
Large White	*Pieris brassicae* L.
Small White	*P. rapae* L.
Green-veined White	*P. napi* L.
Clouded Yellow	*Colias croceus* Fourc.
Large Skipper	*Ochlodes venata* Br. & Grey.

Moths.

Lime Hawk	*Mimas tiliae* L.
Poplar Hawk	*Laothoe populi* L.
Eyed Hawk	*Smerinthus ocellata* L.
Elephant Hawk	*Deilephila elpenor* L.
Puss moth	*Cerura vinula* L.
Buff tip	*Phalera bucephala* L.
White Ermine	*Spilosoma lubricipeda* L.
Buff Ermine	*S. lutea* Hufn.
Vapourer	*Orgyia antiqua* L.
Ruby Tiger	*Phragmatobia fuliginosa* L.
Garden Tiger	*Arctia caia* L.
Cinnabar	*Callimorpha jacobaeae* L.
Sycamore moth	*Apatele aceris* L.

Poplar Grey	*A. megacephala* Fabr.
Grey Dagger	*A. psi* L.
Marbled Beauty	*Cryphia perla* Fabr.
Turnip moth	*Agrotis segetum*
Shuttle-shaped Dart	*A. puta* Hübn.
Heart and Dart	*A. exclamationis* L.
Yellow Underwing	*Triphaena pronuba* L.
Cabbage moth	*Mamestra brassicae* L.
Dot moth	*Melanchra persicariae* L.
Broom moth	*Ceramica pisi* L.
Bright-line Brown-eye	*Diataraxia oleracea* L.
Mottled Rustic	*Caradrina morpheus* Hufn.
Wormwood Shark	*Cucullia absinthii* L.
Silver-Y	*Plusia gamma* L.
Yellow Shell	*Euphyia bilineata* L.
Lime-speck Pug	*Eupithecia centaureata* Schiff.
Peppered moth	*Biston betularia* L. f. *carbonaria*
Burnet	*Zygaena* sp. (*lonicera*?) worn ♀

The Lime Hawk *Mimas tiliae* is a common moth in London, particularly in the suburbs where almost every lime and elm will produce larvae; it is therefore not surprising that these should be found in quantity on two stunted limes in St. Giles' churchyard. Examination of these trees in the Spring of 1949 revealed pupae just beneath the soft rotting bark, several feet above ground level. Pupation usually takes place in earth at the base of a tree, often among roots of grass, but in towns where pavements or stonework extend up to the bole, this habit is developed where the bark is sufficiently loose or soft. As many larvae wander when unable to burrow and are consequently killed, bark pupation seems necessary as a means of survival. This moth is considered to have been present before the bombed site period, and a change in status in central London as a result of the bombing has not been observed. Poplar Hawks *Laothoe populi* have become well established on poplars, twenty larvae being noted on one small shrub in 1948. Various species of *Salix* are not favoured here, though in some parts of London these are common food plants. Most abundant of the hawk-moths at Cripplegate is the Eyed *Smerinthus ocellata* which feeds mainly on *Salix*, the larvae sometimes occurring in great numbers, low down on large-leaved bushes growing below pavement level on basement floors. Apparently they wander for considerable distances when ready to pupate, as few pupae have been noted at the roots of bushes. Pupae found have been beneath tufts of grass growing in holes or cracks in the hard concrete floors, usually in a dry situation. The larva seems to enjoy a long season having been seen adult in July and mid-October. Large numbers are affected by a hymenopterous parasite, which forms hard seed-like cocoons on its dead host.

Elephant Hawks *Deilephila elpenor* have aroused considerable interest among Londoners when the adult larva, a most striking creature, leaves the food-plant and wanders over City pavements in search of a suitable site for pupation. In 1948, I made an attempt to estimate larvae numbers, but found this impossible owing to the extreme abundance of the food-plant, *Epilobium angustifolium.* The moth is a powerful flier soon colonizing any suitable area, but to my knowledge has not been as abundant in the City as in the suburbs. Parasitization is heavy, some larvae being "stung" more than once. In 1948, few were found affected and it was then believed that the parasites had not established themselves in numbers. The adult larva is dimorphic, having a green and a brown form, and it is interesting to speculate why the dark and easily seen form is abundant and the green form rare. Birds are presumably warned away by "eye" markings on the third and fifth segments, but green larvae would be far less obvious and the warning markings are present in both forms. However, most *elpenor* are parasitized before the fifth moult and they are then almost invariably green.

Another strong-flying moth inhabiting Cripplegate is the Puss *Cerura vinula* which may have arrived about 1946. Six larvae appeared in 1947, but despite an intensive search none were seen in 1948. In 1949 and subsequently they have been increasingly common and according to P. W. E. Currie these larvae together with those of a social sawfly *Trichiocampus viminalis* are in danger of wiping out the small poplars. Besides poplar, willow and sallow are eaten.

The Buff-tip *Phalera bucephala* is of considerable economic importance in view of the destruction wrought by the gregarious larvae to deciduous trees. The moth has gained a very firm hold on the bombed sites for in 1948 many bushes had been completely defoliated by the end of the summer; there being a marked decrease in 1949. I am unable to supply a comparison for the following years. In 1948, I collected two dozen adult larvae from the Cripplegate area and twenty-two moths emerged the following spring, not one pupa parasitized. Extreme and prolonged damp seems fatal to the pupae, mould developing around the abdominal segments and penetrating through the spiracles. This is enhanced by the fact that no cocoon is formed, indeed many pupate simply on the surface of the ground. The top soil at Cripplegate is in some places dry owing to its formation from mortar, etc., and the assumption is that this more exactly provides ideal conditions for pupation. It became excessively abundant on bombed sites in the suburbs of south-east London similar in soil composition to the survey area (Owen 1951). Mortality is considerably lower than in the open country, the only enemies so far detected are birds, which take few larvae owing to their hairy nature.

Two ubiquitous moths, the Buff and White Ermines *Spilosoma lutea* and *S. lubricipeda*, are abundant in the area. Oviposition takes place almost exclusively on sallow; most of the newly hatched larvae quickly drop to the ground to feed on low plants, quite often remaining in the vicinity of the original bushes. My impression, judging from larval quantities, is that *lutea* is the commoner species, this perhaps may be due to the fact that the larvae are more noticeable, as they remain on the sallows longer. Unlike *bucephala* neither seem greatly affected by moisture in the pupal state, though emergence of the moth may be delayed during exceptionally dry spells and possibly there is fairly high mortality at this stage. The Ruby Tiger *Phragmatobia fuliginosa* can hardly be classed as a garden species and must have travelled somewhat further than moths dealt with so far. This moth may only have been a wanderer, possibly wind-borne, for apart from a few seen in April 1948, records are lacking. From notes made elsewhere and according to the relevant literature, the species appears very adaptable, occurring in a wide variety of habitats, so possibly the records are not surprising. In spring, great numbers of Garden Tiger *Arctia caia* larvae come forth from hibernation and feed on *Senecio squalidus* and other low-growing plants. Many are parasitized in the autumn and a high rate of mortality is experienced before pupation. During 1948, larvae were excessively common, far more numerous than I had ever seen them elsewhere, but now the parasites have gained a hold, numbers have dropped appreciably. The almost evergreen character of *Senecio* in winter is probably favourable to a hibernating larva such as this, for on warm days, particularly in early spring, the larvae may come up to nibble a few leaves. *Senecio* is one of the dominant plants of the bombed sites and another moth associated with it, the Cinnabar *Callimorpha jacobaeae* is now very abundant. Larvae were first recorded in 1948, and in each successive year the species has become progressively commoner throughout central London, including Cripplegate. The abundance of *Senecio* is doubtless the most important factor governing the spread of this species.

The Sycamore moth *Apatele aceris* is common in London, especially in the larval state, but it was with a certain amount of surprise that in 1948 I found its larvae abundant on sallow, a most unusual food plant. The natural food plant, sycamore, does not occur in the immediate vicinity of the survey area. Another common London species, the Grey Dagger *Apatele psi* is abundant in larval state on lime and sallow, but is heavily parasitized by a hymenopteron, *Pimpla instigator*, and a dipteron, *Eumea mitis*. Examination under the bark of the small shrub limes in St. Giles' churchyard revealed many pupae of this species, most of which were surrounded by pupae of its parasites. Yellow Underwings *Triphaena pronuba* are common. The larvae feed among the roots of *Senecio* and various grasses wherein pupation takes place in the spring. Thickly rooted soil in basement cracks and crevices is favoured as the pupa survives well under these conditions. The moth varies considerably and most forms, including an example with melanic forewings, have been obtained in the Cripplegate area.

Few Geometrids have been recorded. One, the Yellow Shell *Euphyia bilineata* is abundant and in June 1949 imagines were frequently disturbed from undergrowth by House Sparrows and Black Redstarts, and were occasionally caught and eaten by these birds.

REFERENCES.

CURRIE, P. W. E. (1950). Some Notes on the Birds of the Bombed Sites. *London Naturalist, 29*: 81.

LANKTREE, P. A. D. (1951). Lepidoptera at Light in a London House during 1951. *Entomologist's Record, 63*: 237.

OWEN, D. F. (1951). Bombed Site Lepidoptera. *Entomologist, 84*: 265.

The Sawflies of the Cripplegate Bombed Sites.

By P. W. E. Currie.

As the larvae of sawflies feed for the most part externally on vegetation and are likely to be found by anyone who is studying lepidoptera, it is thought that it may be useful to publish, as a companion to Mr. D. F. Owen's paper, a brief account of those sawflies that have so far been found. Not very many have been seen, only 12 out of the 460 or so British species. This, however, is hardly surprising. More than half of the British species whose host plants are known are attached to woody plants, and the majority of species frequent woodland or damp and marshy areas where their food plants are found. The arid and sun-scorched areas of the bombed sites therefore present few attractions to most species. In addition most sawflies are rather weak fliers and heavily built, so that they are presumably less liable to dispersion by the wind than, for example, the smaller diptera.

A number of species have no doubt existed for many years in London's gardens and parks. For example, the galls of *Nematus proximus* may often be seen on the leaves of various smooth-leaved willows in St. James's Park and elsewhere. Some of the species here recorded must, however, have come to the bombed sites from a greater distance.

The pattern of development of the population seems to be much the same as for the lepidoptera, though so far no example has been observed of the sudden decrease of a species on the arrival of its parasite, as happened with *Arctia caia* and *Deilephila elpenor* among the moths. There may, however, be other limiting factors which prevent a species from increasing beyond a certain point, as is suggested below in the case of *Nematus pavidus.* Several species have reached a level of abundance at which they appear capable of having a significant effect on the vegetation. *Croesus septentrionalis,* with its large gregarious larvae occurring sometimes in colonies of several hundreds, may completely defoliate a small birch sapling; two instances of this have been observed, one being a sapling of about 6 feet in height, and in both cases the sapling died. The gregarious larvae of *Trichiocampus viminalis* feed on *Populus* spp. Comparatively few trees of this genus occur in the area: larvae of this sawfly were very abundant in at least one place in 1951, and they, together with the larvae of the Puss moth, *Cerura vinula,* may produce serious effects. No evidence has been obtained that any of these species are parasitized. It is unlikely that they are attacked by birds; they are conspicuous in coloration and habits, and *C. septentrionalis* and *N. pavidus* have ventral scent glands from which they give off an offensive odour. Sparrows, which often frequent the trees on which these species feed, have not been seen to take the larvae.

Nematus pavidus, whose larvae feed gregariously on *Salix* spp., is curiously local in its distribution on the bombed sites, being found mainly on these trees which grow in sheltered spots in the deeper basements, especially where there is some protection from the full force of the sun. It is normally found, in my experience, chiefly in those marshy habitats where its food plant grows most abundantly. It therefore seems probable that the extreme conditions of heat and drought which prevail over the open parts of the bombed sites prevent its wider increase.

Not many observations have been made on the larvae which feed on herbaceous plants. Few of these are gregarious and many of them are inconspicuous. Only two species seem to be present in sufficient numbers to have any appreciable effect. Of these *Athalia glabricollis* has been found on *Diplotaxis tenuifolia*, and *Aneugmenus stramineipes* feeds on bracken. The latter species was first observed in 1950, when it was already abundant. Its progress and its effect on its food plant will be watched.

I am indebted to Mr. D. F. Owen and to Mr. L. Parmenter for several specimens. The nomenclature used in this paper is that used by Mr. R. B. Benson in his Synopsis (Royal Entomological Society of London, Handbooks for the Identification of British Insects, Vol. VI, Part 2, 1951-).

List of Species.

Dolerus gonager Fab. ♀, 17th May 1947, on leaves of *Polygonum* sp. in the garden of St. Giles'. I have another record of this species from central London, a ♀ from St. James's Square, 10th May 1948. The larvae feed on various grasses.

Athalia cordata Klug. ♀, 24th April 1948. The larvae feed on various low herbaceous plants.

A. glabricollis Thomson. ♀, 27th August 1949, on leaf of *Salix* sp. 2 ♂♂, 29th July 1950, Moor Lane, on flowers of *Achillea millefolia*, where others were also seen. ♀, 18th August 1951, swept from *Diplotaxis tenuifolia*, west of Wood Street; in 1950 the larvae of this species were swept from *Diplotaxis* in this area.

Aneugmenus stramineipes Klug. 17th June 1950, very abundant, mainly on leaves of *Salix*, to which they may have been attracted by honeydew. 2nd June 1951, many seen on bracken, *Pteridium aquilinum*, on which the larvae were abundant on 27th July 1951.

Scolioneura betuleti (Klug). 11th August 1951, three mines in leaves of *Betula* sp.

Fenusa pusilla (Lep.). 11th August 1951, four mines in a single leaf of *Betula* sp.

Trichiocampus viminalis (Linn.). 29th July 1950, two batches of about 10 larvae each on leaves of *Populus* sp. south of White Street; one larva in the same place 11th August 1951. Larvae in all instars very abundant on two plants of *Populus* sp., Type Court, 11th August 1951.

Croesus septentrionalis (Linn.). 26th August 1948, a small birch completely stripped by the larvae. In 1950 colonies were found on *Betula* sp. at Basinghall Street, north of London Wall and at White Cross Street. In 1951 colonies were seen at White Cross Street, Type Court and Red Cross Street.

Nematus proximus Lep. Galls very abundant every year on leaves of *Salix viminalis* south of Fore Street.

N. pavidus Lep. Several strong and persistent colonies on rough-leaved *Salix* spp. in various parts of the area, not varying much in abundance from year to year.

N. curtispina C. G. Thomson. ♀, 29th July 1950, on *Salix* leaf, Wood Street. ♀, 18th August 1951. In July and August 1951 the solitary larvae were abundant and widespread. Several cocoons of greenish silk were found spun up in the partly rolled margins of growing leaves. From a batch of about 30 larvae no parasites were bred; the perfect insects emerged from 12 to 20 days after the larvae spun up.

N. polyspilus Forster. ♂, emerged 28th June 1949, bred by Mr. D. F. Owen from a larva found on *Salix*. ♀, 18th August 1951, on leaf of *Salix*.

The Climate, 1951.

By H. Hawkins.

(Observed at 119 Beresford Road, Chingford.)

BAROMETER.

Maximum for the year	30.60	on November 27th.
Minimum for the year	28.40	on February 4th.
Average for the year	29.88	

TEMPERATURE.

	SCREEN.		GRASS (Night min.).	
Maximum for the year	85	on July 28th.	60	on 19th and 31st July and 1st August.
Minimum for the year	22	on Dec. 11th.	17	on Dec. 13th.
Average Maximum	57.17			
Average Minimum	42.88			
Average for the year	50.02		39.47	
Average daily range	14.29			
Maximum range	63			

GENERAL NOTES.

Temperature.

THE weather in 1951 will be remembered for its lack of really hot days, and the poor holiday months of August and September. Curiously enough, it is reported that the hours of sunshine recorded were above average. Generally it was a cold Spring, there was no warm weather spell, and November was an unusually mild month. The Bank Holiday week-ends were generally cool and wet.

June was the sunniest month, and the warmest day of the year occurred on July 28th, with a maximum temperature of 85 degrees. There were only 7 days with temperatures of 80 degrees or over, and they all occurred in July. The coldest days were December 11th, when the night minimum was 22 degrees, and January 29th, when the temperature dropped to 24 degrees. The average temperature for the year is the lowest since I commenced observations in 1944—the average for the period 1944-1951 is 50.88 degrees.

RAIN.

33.70 inches recorded against the average for Chingford of 24.92 inches makes the heaviest total since 1905, the year that known records are available. Over that period there are only 8 years when rainfall exceeded 30 inches, and the next wettest to 1951 was 1939, when 32.40 inches was recorded.

The heaviest falls this year occurred on:—

August 6th (Bank Holiday)	1.05 inches
September 27th	0.92 ,,
May 26th	0.73 ,,
November 17th	0.70 ,,

Every month except June, July, October and December, the rainfall was above average. February and November were excessively wet, the former being nearly 4 inches above average, and the latter just over 2 inches. Incidentally, August was 3 inches above average in Chingford.

In general, the weather caused a very late start for farmers and gardeners in the Spring, and the wet months of August and September were a great handicap to harvesting.

	BAROMETER.			TEMPERATURE.										RAIN.					
											GRASS. (NIGHT MINIMUM).								
Month.	Max.	Min.	Avge.	Max.	Min.	Avge. Max.	Avge. Min.	Avge.	Avge. Daily Range.	Max. Range.	Max.	Min.	Avge.	Amt. in Inches.	No. of Rain Days.	No. of Wet Days.	GALES.	THUNDER.	FOG OR MIST.
Jan.	30.40	28.95	29.78	52	24	44.42	35.74	40.08	8.68	28	44	19	32.00	2.54	20	13	2	—	2
Feb.	30.30	28.40	29.60	49	27	44.07	33.75	38.91	10.32	22	37	22	30.53	5.51	24	20	3	—	—
Mar.	30.35	28.60	29.70	57	25	46.97	34.55	40.76	12.42	32	47	20	31.29	3.28	19	15	2	—	2
Apr.	30.25	29.05	29.87	76	30	55.30	36.53	45.91	18.77	46	41	24	31.93	2.82	17	15	1	5	—
May	30.15	29.40	29.86	72	36	58.84	44.29	51.56	14.55	36	49	30	41.13	2.38	14	13	1	1	—
June	30.25	29.60	29.86	75	43	69.53	48.96	59.24	20.57	32	59	39	45.63	0.53	6	4	—	—	—
July	30.40	29.70	30.04	85	46	72.58	54.13	63.35	18.45	39	60	42	51.06	1.19	8	5	—	2	—
Aug.	30.20	29.50	29.84	78	48	69.16	52.93	61.05	16.23	30	60	43	49.68	5.29	17	15	—	4	—
Sept.	30.35	29.60	30.01	79	44	67.00	51.93	59.46	15.07	35	59	36	47.40	3.08	13	10	—	2	1
Oct.	30.50	29.80	30.16	65	27	57.55	42.29	49.92	15.26	38	57	25	39.03	0.63	11	5	—	—	5
Nov.	30.60	29.15	29.71	59	30	53.13	41.86	47.49	11.27	29	50	25	38.93	4.61	23	19	1	2	—
Dec.	30.55	29.15	30.20	53	22	47.51	37.64	42.57	9.87	31	48	17	35.03	1.84	14	9	6	—	3
														33.70	186	143	16	16	13

Book Reviews.

The Study of the Distribution of British Plants: Being the Report of the Conference held in 1950 by the Botanical Society of the British Isles. J. E. Lousley (Editor). Pp. 128 + 28 figures and maps + 2 plates. Arbroath: T. Buncle & Co. Ltd., for the Botanical Society of the British Isles, c/o Department of Botany, The University, Oxford, 1951; 10/- nett.

The Botanical Section of the London Natural History Society adopted the Watsonian Vice-county system of recording in 1946, and the Entomological Section followed suit in 1948; members of these and other sections should, therefore, find much to interest them in this report of the second conference held by the Botanical Society of the British Isles.

After a short introduction by the President of the Society, Dr. S. M. Walters traces the history of the study of plant distribution from Willdenow's *Grundriss der Kräuterkunde* published in 1792 to Cain's *Foundations of Plant Geography* which was printed in 1944, and concludes by suggesting various ways in which naturalists may assist in adding to the present knowledge of plant distribution in these islands, one method being, to use the author's own words—" the careful recording of the spread of alien species . . . which can yield much valuable data on the relation of distribution to dispersal methods, climate, soil, and other factors." Mr. J. E. Dandy describes and gives an historical account of the Watsonian Vice-county system, and discusses its advantages and difficulties, while Mr. J. E. Lousley reviews the system in practice, and gives an analysis of the compilation of H. C. Watson's *Topographical Botany*, and remarks upon its accuracy and imperfections. He also puts forward suggestions and proposals for improving the method of recording the distribution of species on base maps. Mr. W. T. Stearn discusses modern technique in use in Europe and America for mapping the distribution of plants, and Prof. Ir. A. W. Kloos outlines the study of plant distribution in Holland, and the mapping methods used by modern observers there.

Dr. J. G. Dony deals with the problems of distribution raised in the compilation of a county flora, and uses Bedfordshire as his example. Dr. D. H. Valentine discusses geographical distribution and isolation in some British ecospecies, and Mr. C. D. Piggott gives an account of the geographical distribution of the British species of *Thymus* with a key to the identification of the plants. Dr. K. B. Blackburn provides an historical approach by dealing with some late-glacial species from the Lower Tees area and their present distribution. In conclusion, Prof. A. R. Clapham puts forward a proposal for mapping the distribution of British vascular plants.

The report also contains numerous accounts of exhibits shown at the conference. Indeed, the whole volume is packed with information which is not easily available elsewhere and some original.

D. H. K.

Flies of the British Isles. By C. N. Colyer and C. O. Hammond. 1st Edition, 1951. Warne & Co., London. 30/-. 48 plates in colour, 55 half-tone plates and numerous text-figures and diagrams, depicting 286 representative species from original enlarged microscope drawings.

For many years now there has been no guide-book available for studying the British Diptera as a whole and this gap has, no doubt, been a serious handicap to students needing to learn about this Order and a very great deterrent to many an enthusiast who might have liked to follow up an interest in the diversity of flies that surround us.

The authors, two well-known members of our Society, have given us, in the compass of a largish pocket book, a survey of the commoner and more important British flies. One does not envy them the task of selection but one can applaud the usefulness of their choice, for on trying out the book with specimens recently collected—the real test of a book of this nature—most of these have been easily located and helpful information about them obtained.

The text of the book starts with a clear account of the structure of typical flies and the text-figures illustrate very clearly the diagnostic features employed in later chapters. The main part of the book is devoted to a well-illustrated systematic account of the families and contains keys at the end of each Section. Wherever possible these chapters include in addition to the systematic definition biological data of well-known species and many a pointer for further study of the lesser known species. The references to specialist works will prove of assistance to those who have adequate library facilities.

A full appendix gives useful hints to collectors and helpful advice about labelling; in referring to this section, one can only regret the anonymity of the last four plates in the book—many readers would have appreciated a personal introduction to the authors!

To specialist and non-specialist alike, the outstanding feature of this book is likely to be the colour plates, drawn with that meticulous attention to detail which is the hall-mark of craftsmanship and reproduced with a remarkable degree of clarity. These plates will prove a great help in identification and, we dare to hope, a stimulus to much better appreciation of this much maligned Order.

Finally, we must congratulate the authors on the successful completion of this stage of their labours and we hope that for many years to come they will continue to share in the activities of our Society. We must also express our thanks to all those concerned with the production of the book—Warnes have, as so often before, placed all naturalists and would-be naturalists deeply in their debt, and have given many of us a book which we shall value greatly.

J. F. S.

Obituaries.

J. A. Simes.

THE last remaining member associated with the origin of the "London" Society, James Applegate Simes, died on 24th April 1951, in his 78th year.

Born at Clapton and educated at the Grocers' Company School, Hackney Downs, his interest in natural history commenced at a very early age, for he was the last survivor of four of his school fellows who in 1886 started the Clapton Naturalists' Field Club.

The Clapton of Simes' days was almost a country suburb of London, with the River Lea and its marshes at his door and Epping Forest within easy reach, offering excellent collecting grounds for moths and butterflies—an interest which remained with him for life.

Later, his school organized a natural history society of which he and his friends took advantage, but on leaving, Simes and others decided to form a new society to be known as the North London Natural History Society, founded in 1892. At this time he was also a member of the City of London Entomological and Natural History Society, acting as Joint Secretary in 1891-2. This society was the second of the two whose amalgamation formed the present London Natural History Society in 1914.

Qualifying for the Home Civil Service—Post Office—he later transferred to the Ministry of Pensions on its formation, in which he spent the remainder of his official career. While serving in the Post Office he not infrequently did duty as Eastern Mail Officer, journeying to Italy (Brindisi), during which visits he had opportunity for collecting, becoming acquainted with species new to him, which laid the foundation of his great interest in European Lepidoptera, more particularly the butterflies. In years following he made collecting trips to France, Spain, Switzerland, Mediterranean Islands, Germany, etc.

In September 1899 he was in company with our late member A. W. Bacot in Scotland when the type specimen of the new British species *Hydraecia crinanensis* Burrows was taken.

On retiring in 1937 Simes took up the study of the family *Notodontidae* at the British Museum (Natural History) and re-arranged the collection, but had to relinquish the work on being called in 1939 to act as Secretary to the Government Commission on Miners' Nystagmus, which appointment lasted till 1945 when he finally retired. He had received the O.B.E. in the Birthday Honours of 1926.

During the early days of the North London Society, Simes filled many offices, including that of President (twice) and Vice-President. He was on the Council many times during the years 1893-1909, and acted as Librarian, 1904-1908. He read many papers and communications on natural history subjects, four of which are printed in the *London Naturalist*, viz.: "Some Aspects of Bird Life in Europe", 1916; "The Pupation of *Papilio podalirius* L.", 1934; "Jottings of a Naturalist in France and Italy", 1935; and "Concerning the Alpine Race of *Pieris napi*", 1937.

He joined the Royal Entomological Society of London in 1911 and served on the Council in the years 1935-7 and 1947-9.

Of about thirty contributions to the entomological journals, nearly all dealt with some aspect of life history in the *Lepidoptera*, and among these might be instanced: *Ent. Record*, 1910, pp. 231-6, "Notes on the *Lepidoptera* of Brindisi"; *Ent. Record*, 1915, pp. 173-8, "A Month among Spanish Butterflies"; *Ent. Record.*, 1920, pp. 197-9, "*Gonepteryx cleopatra* L. Has it more than one brood per annum?" *Entomologist*, 1932, pp. 227-9, "Some Observations on *Agriades bellargus*"; *Ent. Mon. Mag.*, 1933, pp. 276-8, "*Arundo donax* and its Insect Guests"; *Entomologist*, 1937, pp. 28-31, "Some Thoughts on the Genus *Agapetes* Billb."; *Proc. R. Ent. Soc. London*, (A) 13: pp. 80-1, 1938, "Observations on Butterflies, July 1937, in Southern France".

Although interested in birds and plants and widely read in general zoology his principal love was undoubtedly insects. He was also a competent alpine gardener, his rock garden at his Loughton home, of his own construction, having many uncommon and interesting alpines, mostly of his own collecting during continental visits.

Simes married in 1908 Miss Alice Gallop, the youngest daughter of the late Rev. R. W. Gallop, Rector of Eversley, Hants., and leaves a son and a daughter.

As a friend for upwards of half a century of the writer of these notes, "Jim" to his intimates was a welcome companion in the field, always ready to share or give information and help. Being blest with a keen sense of humour, days spent in his company leave the happiest of memories.

S. A.

Arthur Brown.

By the passing of Arthur Brown in his 92nd year the Society has lost its senior supporter after a membership of 35 years.

His activities in the Society were chiefly in the Ornithological Section and were of special value at the end of the first Great War when, many members still being on active service, he acted as Secretary and Recorder to the Section from 1917 to 1919, continuing in the latter office to 1927, a period of 11 years. He served on the Council in 1918 and 1919. For his services and seniority he was elected an honorary member of the Society. In 1941 his house in London being destroyed by enemy action he removed to Eastbourne, where he died on 28th January 1951. His interests were wide, natural history and archaeology being the chief, and he was well informed in many "byways" of history and art. Enjoying excellent health during his long and active life he was a most friendly and helpful companion and his intimates will preserve the happiest memories of a lovable man.

S. A.

STATEMENT OF ACCOUNTS

GENERAL

1950	*Receipts.*		
£683 19 0	Subscriptions—Current	£708 3 0	
29 0 0	Arrears	22 3 0	
9 17 6	In advance	12 5 0	
19 17 6	Entrance Fees	18 0 0	
£742 14 0			£760 11 0
15 3 6	Interest on Post Office Account		16 0 4
2 12 6	Interest on £75 War Stock, 3½%		2 12 6
2 0 0	Donations		2 2 6
12 0 0	Donation from Pioneer Club Field and Archaeological Circle		—
			£781 6 4
—	Transfer from Reserve Account		35 0 0
£774 10 0			£816 6 4
21 8 3	Balance, 31st October 1950		82 8 2
£795 18 3			£898 14 6

PUBLICATIONS

£61 9 10	Sales of Publications	£59 6 4
5 1 0	Advertisements in *London Bird Report*	5 1 0
62 0 0	Grant from the Royal Society	—
6 10 0	Donations	0 15 0
17 6 6	Sales of Christmas Cards	26 7 6
251 7 5	Balance to General Account	443 18 0
£403 14 9		£535 7 10

LEGACIES

Balance, 31st October 1950	£41 0 0
Further proceeds of sales of books ex P. J. Hanson bequest	2 7 6
	£43 7 6

BOTANICAL RECORDS

Balance, 31st October 1950	£35 10 1
Interest on Post Office Account	0 16 6
	£36 6 7

LIFE COMPOSITION

Balance, 31st October 1950	£285 0 0
Cash received—one additional Life Member	20 0 0
	£305 0 0

RESERVE

Balance, 31st October 1950	£90 0 0
Anonymous Donation to this Fund	20 0 0
	£110 0 0

Audited and found correct.

R. E. BUTLER, Auditor.
E. B. BANGERTER, Auditor.

YEAR ENDED 31st OCTOBER 1951.

ACCOUNT.

1950	*Payments.*	
£123 10 0	Rent	£141 11 0
87 5 9	Programme expenses (Printing and Postages)	98 19 6
39 16 7	Printing and Stationery	19 7 11
23 1 3	Postages—Secretary and Treasurer	16 13 3
2 19 5	Insurance	2 18 6
4 0 0	Gratuities	4 0 0
10 8 0	Subscriptions	8 6 0
44 2 5	Sectional expenses	46 9 6
2 18 9	Chingford Branch expenses	4 10 6
3 10 10	Grant—" Birds of London Area "	1 18 9
81 0 0	Secretary's Honorarium and clerical assistance	81 0 0
20 0 0	Library expenses	10 0 0
2 19 10	Exhibition expenses	—
3 9 10	Lecturers' expenses	4 18 6
1 0 0	Sundry expenses	3 19 0
—	Library list—Botanical Section	3 6 0
12 0 0	Purchase of books ex Pioneer Club donation	—
251 7 5	Publications Account	443 18 0
£713 10 1		£891 16 5
82 8 2	Balance, 31st October 1951	6 18 1
£795 18 3		£898 14 6

ACCOUNT.

£397 4 7	Printing and Postages—*London Naturalist* and *London Bird Report*	£529 12 5
5 17 0	Christmas Cards	5 9 11
0 13 2	Sales Team expenses	0 5 6
£403 14 9		£535 7 10

ACCOUNT.

Balance, 31st October 1951	£43 7 6
	£43 7 6

ACCOUNT.

Expenses during year	£2 0 0
Balance, 31st October 1951	34 6 7
	£36 6 7

ACCOUNT.

Balance, 31st October 1951	£305 0 0
	£305 0 0

ACCOUNT.

Transfer to General Fund	£35 0 0
Balance, 31st October 1951	75 0 0
	£110 0 0

J. H. G. PETERKEN, Hon. Treasurer.

Official Reports for 1951.

Council's Report.

OUR membership graph continues on its steep upward climb, reaching a new record of 1165 on 31st October. Of this total 978 are Members, 177 Associates and 10 Affiliated Societies. This is a net increase of 81 over last October's total. The fact that the increase has been shared by every Section is most encouraging.

We would express our thanks to the President and Council of the Linnean Society for the privilege of using their Rooms at Burlington House for some of our meetings, and hope that this agreement will be of benefit to both our Societies. This move does not, however, solve our accommodation problems, for your Council's greatest worry this year has been and, indeed, still is the search for accommodation for our Library and Collections. In spite of a printed appeal to all members and of the efforts of a special Accommodation Committee, we still remain without permanent headquarters. We are also in need of a small room for the meetings of the ever growing number of committees that are essential to the running of a large and active Society. The difficulties of this search for accommodation have made clear the debt we owe to the Dean of the London School of Hygiene for his generosity in housing our Library and Collections for so long.

Our best wishes and thanks for her work as Secretary of the Chingford Branch go to Miss B. B. Knott, who is leaving the London area. The new Secretary of the Branch will be Mr. E. B. Pinniger. The resignation of Mr. Norkett as lanternist calls attention to the work he and Mr. Payton have been doing, so efficiently and unobtrusively for so many years, and we would take this opportunity to ask for more volunteers to help Mr. Payton in this essential service. We have also to thank Mr. Ryall and his Sales Team who have kept our publications so prominently displayed at all our indoor meetings, and Mr. Ashby who is responsible for the Christmas Cards that have again proved so popular.

The resignation of Dr. Hayward from the Chairmanship of the Geology Section calls for more than Sectional comment. Since the formation of the Geological Committee in 1937, Dr. Hayward has been its Chairman: he has seen the Committee recognised as a Section and though he would be the last to claim credit for the steady increase in membership and activities of the Section, we know how much the Section will miss his initiative and drive.

At the International Congress of Entomology at Amsterdam our Society was represented by Dr. de Worms, Chairman of our Entomological Section. The Society was also well represented at the seventh Congress of British Entomologists, held this year in London under the joint auspices of the South London Entomological and Natural History Society and our own Society.

We record with regret the following deaths:—A. Brown, W. A. L. Friedlein, Miss W. G. Gordon, Miss D. M. Hoyle, D. Muirhead, W. M. Page, D. C. Rattenbury, J. A. Simes. Obituaries of A. Brown and J. A. Simes have been written for the *London Naturalist.*

Chingford Branch Report.

During the year the Branch held the usual monthly indoor and field meetings; indoor attendance averaged 15 and field attendance 5—a slight decrease on last year.

The Branch held its Annual General Meeting in December 1950, and Mr. E. A. Round gave a short talk on Switzerland. At the first meeting in 1951 Mr. W. Teagle gave an illustrated talk on Birds of Central London. An entomological evening was held in February when Mr. R. D. Weal gave a lecture on Beetles, followed by our youngest member, Mr. R. Shaw, reading a thoughtful paper on Lepidoptera, ably assisted by Mr. J. Keyes. In March, Mr. J. F. Shillito gave a most interesting talk on Parasites and Parasitism illustrated with some fine slides. The Spring session was ended by Mr. A. G. Leutscher giving a delightful talk on British Reptiles, and showing his enthusiastic audience many live specimens.

The Autumn programme commenced in October with a discussion on Summer Activities. In November Mr. B. T. Ward gave one of his attractive botanical talks on Some Common Essex Plants, showing some beautifully mounted plants.

At the Branch's Annual General Meeting Mr. Ward was elected Chairman and Mr. E. T. Nicholson Vice-Chairman. Miss B. B. Knott resigned from her position as Secretary as she was leaving the district and Mr. E. B. Pinniger took her place. Messrs H. W. Forster, E. A. Round, W. G. Vincent and R. D. Weal were elected to the Council.

Two Branch Associates were enrolled and two resigned.

E. B. Pinniger, *Chairman.* B. B. Knott, *Secretary.*

Nature Conservation Committee's Report.

THE activities of the N.C.C. have centred around the preparation by the County Representatives of the detailed County Reports, the first of which, for Middlesex and Bucks, was produced in 1950 and was sent to the Nature Conservancy, as mentioned in the last report.

This year, reports for Essex and Hertfordshire have been completed and sent in to the Nature Conservancy. Those for Kent and Surrey are nearly complete and should be ready by the end of the year.

Mr. Weal was, unfortunately, not able to continue as our Representative for Essex and his place was taken by Mr. R. M. Payne who completed the Essex report. It is satisfactory to record that the Essex Field Club, through Mr. B. T. Ward, has now undertaken to report on nature conservation in the county to the Essex County Council and to the

Nature Conservancy and it is confidently expected that adequate co-operation will be secured between our Society and the Field Club.

With the exception of Essex, schedules of nature conservation sites for the counties in our area have been prepared by the N.C. for the use of county and local authorities and a copy of each has been presented to the Society for our files.

On the whole, most of our recommendations have been included in the schedules, but dissatisfaction was expressed by the Committee at the disappointingly small total of 9 of our recommendations adopted by the Conservancy in their schedule for Surrey. The great importance was stressed of preserving what is undoubtedly the finest and most varied series of habitats within our area, and the dangers of development to them. The Surrey report, with full ecological details for each of the 33 areas originally proposed by the Society (with two additions) is now in its final stages of completion. With this information available, it is hoped that we shall be in a better position to substantiate any proposals and to persuade the Conservancy to increase the number of scheduled areas for Surrey.

Some requests for further details of the boundaries of conservation areas have been received from the Conservancy but otherwise there has, so far, been little discussion, except for a number of geological sites. Considerable correspondence with local authorities and consultations with the Conservancy's geologist, Dr. W. A. Macfadyen, have taken place over some of the sites; further details will be found in the Report of the Recorder of Geological Reserves.

Discussions with the Commons and Footpaths Preservation Society and with the Conservators have continued over the management of Wimbledon Common. Two visits of inspection, in company with the Chairman and Secretary of the Commons and Footpaths Preservation Society and later with one of the Conservators, were undertaken by Messrs. Castell, Foster and Hayman. The matter is still under discussion.

Support has again been given to the Croydon Natural History Society in their efforts to persuade the Local Authority to adopt more effective methods for the preservation of Keston Bog.

Mr. Dallas represented the Society at a Conference of Countryside Protection Societies and kindred organisations in the Dorking and Leatherhead district which was held on the 25th May at Polesden Lacey, Bookham. A permanent Liaison Committee was set up, with representatives from the local Countryside Protection Societies and the local National Trust Committees. Direct representation of our Society on this liaison Committee was not considered necessary.

The Society has become a member of the British Co-ordinating Committee for Nature Conservation which is directly linked with the International Union for the Protection of Nature. An important open technical meeting of the Union took place at the Hague in September 1951, when the problems of the Rural Landscape as a Habitat for Flora and Fauna in a densely populated country and the Management of Nature Reserves were discussed.

The post-war progress of nature conservation in our area was reviewed on April 3rd by the Committee's Secretary, in an address to the Society, entitled "London's Heritage of Wild Nature". It is hoped to prepare an up-to-date report for publication in the *London Naturalist* to take the place of the 1946 Report, which is now out of print and sadly in need of revision.

CYNTHIA LONGFIELD, *Chairman.*
C. P. CASTELL, *Secretary.*

November 1951.

Report of the Recorder for Geological Reserves.

IT is gratifying to be able to note the appointment of a geologist, Dr. W. A. Macfadyen, to the staff of the Nature Conservancy. In spite of the great pressure of work in the initial stages at the Conservancy, Dr. Macfadyen has taken an active and sympathetic interest in our problems. The Section visited the Rock Pit at Elmstead Woods in March and members reported a change of ownership and a danger to the famous section through proposed building. The Nature Conservancy were notified and Dr. Macfadyen immediately investigated the matter on the spot where he saw the new owner, who has agreed to allow access to the section to geologists and other interested persons. Arrangements have been made which, it is hoped, will prevent building too near the section.

A change of ownership of the Harefield Chalk Pit resulted in a proposal to use the pit as a rubbish dump. Negotiations between the Nature Conservancy and the owner appear to have removed the danger of the pit being completely filled up with the loss of the section and some of the interesting vegetation. Our member, Mr. D. H. Kent, and Mr. S. W. Hester of the South Eastern Union of Scientific Societies, were asked to advise the Conservancy on those parts of the pits of greatest value to the botanist and geologist.

The Society was informed by the Hertfordshire County Planning Officer of the proposed development of Grover's Brick Pit, Watford, as a recreation ground. Before the War, this pit showed the Hertfordshire Pudding Stone *in situ.* After correspondence with, and helpful advice from, the Watford Borough Engineer and a visit of Mr. H. A. Toombs to the site, it was reluctantly agreed that war-time dumping of rubbish had taken place to such an extent that it was impracticable to make the section again available.

As a result of the initiative of our member Mr. Butler and after consultation with the Nature Conservancy, the Heston and Isleworth Corporation have erected a large Sarsen Stone from the gravels at Heston in the local park with an appropriate label (see *L.N.*, no. 30, p. 38, and plate).

C. P. CASTELL,
Hon. Recorder for Geological Reserves.

Sectional Reports.

Archaeological Section.

Four Indoor Meetings were held during the year. On February 3rd the Section were the guests of the London and Middlesex Society at the Bishopsgate Institute to hear a lecture on the Excavations at Brockley Hill. Mr. Noel Hume in his illustrated address on February 27th described traces of Roman occupation in Walbrook uncovered during recent building excavations. The lecture arranged for April 17th on the Sutton Hoo Treasure was unavoidably cancelled but Mr. Cocksedge at very short notice delivered a most interesting talk on " Our National Heritage ", also showing many beautiful slides. On October 30th Lt.-Col. G. W. Meates, F.S.A., gave an illustrated talk on the excavation of the Roman Villa at Lullingstone, of which he has been in charge during the past two or three years.

Outdoor Meetings. Twelve of these were held during the period. A visit was made to the British Museum on January 13th to hear an interesting lecture on the Elgin Marbles. A large party was shown round St. Bartholomews Church, Smithfield, on February 17th, and quite a number of members braved a cold, wet day to make a worthwhile tour of Old London Wall under the able leadership of Mr. C. E. Ansell Clayton on March 10th. On the 31st of the same month a visit was made to Enfield Church and then over Forty Hall, a 17th century house in the neighbourhood. On April 14th an informative and exhaustive tour of Hampton Court was conducted by Mr. E. Yates, F.S.A. On May 19th a party was shown over Little Bookham and Great Bookham Churches by Mr. J. H. Harvey. Mr. Cocksedge led a visit to Westerham Church on June 23rd, taking members then to Quebec House, associated with General Wolfe. The archaeological puzzles of Little Missenden Church were examined under the leadership of Mr. H. J. Evans on July 14th. The party then proceeded back to Amersham, visiting a private house in the High Street containing part of 16th century wall paintings of the "Nine Worthies". On September 15th Mr. F. E. Hansford, Chairman of the Fulham History Society, conducted a party over Fulham Palace, recounting many entertaining anecdotes connected with it. A visit to Chelsea Hospital on October 20th was much enlivened by the wit and spirit of the be-medalled pensioner who conducted the party round this Wren building with its Council Chamber, cubicle wards and the Great Hall where Wellington lay in state. On November 24th a large party toured Spitalfields and Shoreditch under the expert guidance of Mr. Cocksedge who pointed out the loom lofts dating from when this area formed an important centre of the silk industry, the gothic market erected by Lady Burdett Coutts and the stocks in Shoreditch churchyard, among other interesting things. St. Sepulchre's, Newgate, was visited on December 29th when an interesting address was given by the vicar. The party then proceeded to St. Bartholomew the Less under the guidance of Mr. Howlett.

Reading Circle. There are 18 subscribers to "Antiquity" and 12 to the "Archaeological News Letter".

W. C. COCKSEDGE, *Chairman.* Miss V. A. STAINES, *Secretary.*

Botanical Section.

Membership. The section has now 265 members, an increase of 19 during the year.

Officers. Miss R. Davis and Mrs. B. Welch have agreed to act as joint librarians. The thanks of the section are due to Mr. C. P. Castell for his services as librarian during the past 4 years.

Mr. R. A. Boniface and Mr. C. L. Collenette have resigned from the committee, and Mr. R. A. Graham has been asked to join.

Indoor Meetings. Two General and four Sectional meetings have been arranged, with an average attendance of 44. Several well known specialists have spoken, including Mr. G. M. Ash (*Epilobium*), Mr. A. H. G. Alston (*Pteridophyta*), Mr. C. E. Hubbard (*Gramineae*) and Dr. D. P. Young (*Epipactis*).

Outdoor Meetings. Fourteen excursions have been arranged with an average attendance of 12. Some localities and plants are as follows: —Hampstead Heath (*Equisetum sylvaticum* L., *Scirpus sylvaticus* L.); Hampton Court (*Ranunculus trichophyllus* Chaix.); Elstead (*Calamagrostis lanceolata* Roth., *Rhynchospora fusca* (L.) Ait., *Utricularia minor* L.); Barnes Common (*Silene anglica* L., *Cynodon dactylon* Pers.); Epping (*Veronica scutellata* L., *Hottonia palustris* L.); Hounslow Heath (*Utricularia vulgaris* L., *Setaria italica* (L.) Beauv.); Nutfield Marsh (×*Mentha gentilis* L., *Mentha citrata* Ehrh., *Mentha alopecuroides* Hull.); Shoeburyness (*Eryngium maritimum* L., *Malva parviflora* L.).

Library. During the year, a complete index to the botanical library has been published; copies are available at 6d each.

Reading Circle. It has been found necessary to increase the subscription to 1/6 per annum. For this members receive the publications of the Botanical Society of the British Isles, which include several parts of *Watsonia* each year, the *Year Book*, and reports of special conferences.

Individual Work. Members engaged on original botanical work are invited to discuss this with the Botanical Committee, with a view to the inclusion of suitable papers in the *London Naturalist*.

D. H. KENT, *Chairman.* F. E. WRIGHTON, *Secretary.*

Ecological Section.

Membership of the Section is now 216, an increase of 18 during the year.

The Section has been responsible for the provision of three General Meetings, when lectures were given on "Midge Larvae and their Place in Pond Ecology" by Miss B. M. Walshe, M.Sc. on January 2nd; on

"London's Heritage of Wild Nature" by Mr. C. P. Castell on April 3rd; on "London's Bats" by Mr. Michael Blackmore on June 5th.

Three Sectional Meetings were also held, when the following papers were read:—"The Natural History of some British Fresh-Water Fish" by Mr. P. T. H. Hartley, B.Sc., on November 26th, 1950; "The Plant Ecology of the Blackheath Pebble Beds" by Mr. C. T. Prime, M.A., F.L.S., on May 8th, 1951, and "The Ecology of Millepedes and Centipedes" by Dr J. L. Cloudesley-Thompson on September 18th.

The average attendance at the official monthly survey meetings at Bookham Common on Sundays was reduced slightly to 12, a result, undoubtedly, of the exceptionally wet year. On the other hand, the average attendance of eight was maintained on the five Saturday meetings also held at Bookham in the Summer months.

The City Bombed Sites Survey has been continued under the leadership of Messrs. Currie and Wrighton, but only two official Sectional visits were held—on April 21st and on August 11th.

In addition to these survey visits, five other field meetings were held. Mr. A. H. Norkett demonstrated woodland vegetation on chalk and on clay at Norbury Park and Leatherhead on 20th May. As a contrast, members were introduced on May 27th to the rich snail fauna of the beechwoods of Sheep Leas, Horsley, by Mr. A. G. Davis. A joint excursion with the Geological Section was led by Mr. G. A. Matthews on June 16th to Abbey Wood to study the relationship between geology and vegetation on the Chalk and on the Lower London Tertiary Beds. On the 15th July, Miss M. Cornish of Bedford College very kindly deputised for Mr. F. Rose and ably demonstrated the ecology of chalk vegetation at Shoreham, Kent.

On the 23rd September, a joint ramble to Headley Heath with the Geology Section was led by Mr. C. P. Castell, but was marred by heavy rain in the morning; however, the small party was able to examine the Pliocene gravels and to study the regeneration of heath vegetation on them.

The Section was again well represented in the *London Naturalist*. The Bookham Common Survey provided four papers:—Dr. Beven on the Birds of Eastern Wood; Mr. Le Gros on Spiders; Mr. Panchen on Reptiles and Amphibians and Messrs. Bangerter and Castell on the Vegetation of the Eastern Plain Gun Pits. The survey report was accompanied for the first time by photographs of some of the habitats.

Mr. Wrighton has provided an account of the Plant Habitats at the City Bombed Sites.

Thirty-three members subscribe to the Reading Circles for the *Journals of Ecology* and *Animal Ecology*.

G. BEVEN, *Chairman*. C. P. CASTELL, *Secretary*.

Entomological Section.

The major entomological event of the year in London, one in which the Section took part, was the Seventh Annual Congress of British Entomologists. Our Society co-operated with the Society for British

Entomology in organizing the Congress, which was held from June 21st to 25th. Twenty members of our Section were present at the main meeting of the Congress, the exhibition held on Saturday, June 23rd, and we were represented by our secretary at the meeting of delegates from local societies held on the same afternoon.

During the period covered by this Report the Section held four indoor meetings and organized two general meetings of the Society. On 28th November 1950 an informal discussion on the theme " Is Specialization a Good Thing?" was opened by P. W. E. Currie and J. D. Hillaby. On 9th January 1951 H. Oldroyd spoke at a general meeting on "A Visit to the British Cameroons," and another general meeting on 6th March was addressed by Dr. N. Waloff on " Observations on Short-horned Grasshoppers." Two meetings were devoted to exhibits and short notes, on 24th April and 10th July, and on 9th October Prof. H. W. Miles spoke to the Section on the " Biology and Habits of British Sawflies," illustrating his talk throughout with excellent lantern slides. The average attendance at Sectional indoor meetings was 20, a slight decrease from the previous year.

Six field meetings were held during the year, at Boxhill, Ranmore and Oxshott (Surrey), Panshanger (Herts.), Chess Valley (Bucks.) and Higham Marshes (Kent). Attendances varied between 16 and 2, the average being 8. The more interesting insects seen included the following: —

Boxhill (22nd April)—Lepidoptera: *Argynnis euphrosyne*, *Polygonia c-album*. Hemiptera: *Thyreocoris scarabaeoides*, *Podops inuncta*, *Sciscoris cursitans*. Coleoptera: *Lebia chlorocephala*, *Brachinus crepitans*, *Pselaphus lusei*, *Diphyllus lunatus*, *Byrrhus pilula*, *Lampyris noctiluca* (larvae), *Timarcha goettingensis*, *Chrysolina polita*, *C. violacea*, *Pilemostoma fastuosa*, *Orobitis cyaneus*.

Panshanger (20th May)—Coleoptera: *Hister merdarius*, *Gnathoncus nidicola*, *Ischnodes sanguinicollis*, *Xylophilus populneus*—all among debris in a hole in an old oak trunk, below the site of a Barn Owl's nest: also *Barynotus moerens*, *Byturus aestivus*, *Mordellistena abdominalis*, *Ischnomera coerulea*, *Drupenatus nasturtii*, *Oeceptoma thoracica*, *Cateretes bipustulatus*, *Psammoecus bipunctatus* and *Silis ruficollis*.

Higham Marshes (3rd June)—Coleoptera: *Emus hirtus*, *Coccidula scutellata*, *Cassida nobilis*, *Apion malvae*.

We regret to have to record the deaths of three members, W. A. L. Friedlein, D. C. Rattenbury, and J. A. Simes.

Membership of the Section rose by ten during the year, and now totals 158.

Baron de Worms took over the chairmanship of the Section at the beginning of the year, Miss Longfield relinguishing the office after eight years and taking a place on the committee.

Subscribers to the reading-circles decreased to seventeen during the year.

C. G. M. de Worms, *Chairman*. R. M. Payne, *Secretary*.

Geology Section.

Membership of the Section now stands at 104, including 5 country associates, an increase of 16 over last year's total. Five Sectional meetings were held at which the average attendance was 31. Sixteen field meetings were carried out, the average attendance being just under 12. One field meeting to Nuneaton had to be abandoned owing to transport difficulties. At the Sectional Annual General Meeting in October, the resignation of Dr. J. F. Hayward as Chairman of the Section was announced and accepted with regret. Mr. C. P. Castell was elected Chairman.

Indoor Meetings. At a Sectional meeting in January Mr. G. F. Elliott spoke on "The Development and Evolution of Some Brachiopods". He explained the internal structure and evolution of certain genera and illustrated the life history and mode of occurrence of some modern forms. Mr. C. P. Castell gave a talk in March on "Some Fossil Plants and their Living Relatives". An evening in June was devoted to an Exhibition and short talks by members on the Section's activities. In October Dr. A. J. T. Dollar discussed earthquake occurrences in England in his lecture entitled "Recent Earthquakes in the Region of London". Mr. S. E. Ellis gave an interesting account of the geology and natural history of Andorra in his talk in November on "A Geologist in Andorra".

Field Meetings. (a) Museum Visits. The only museum visit made during the year was to the Geological Museum in December when Mr. B. Ainsley introduced members to some of the fossils likely to be seen on the proposed Easter meeting to Weymouth in 1952. He also gave an outline of the programme which it was proposed to carry out.

(b) Outdoor Meetings. Three long-distance meetings were held. The first was to the Reading district by motor-coach. The party were met by Professor H. L. Hawkins, F.R.S., at Reading, and a number of exposures in the Reading Beds and Chalk were examined during the course of the day. Finally after tea, Professor Hawkins showed the party over the geological department of Reading University where his collection of Echinoids was greatly admired. The second coach meeting was to Herne Bay in June under the direction of Dr. W. S. Pitcher where the classic cliff section was examined. The last long meeting was to Pegwell Bay, Ramsgate, in September under the guidance of our member Mr. A. G. Davis. Five other whole-day Sunday meetings were held, all being led by members of the Society. Of the half-day meetings, four were led by visitors—Dr. J. F. Kirkaldy, Mr. S. W. Hester, Mr. A. Wrigley and Dr. T. Barnard—and the remainder by members of the Society. The City of London, North Mimms, Broxbourne, Hainault Forest, Abbey Wood, Elmstead Woods, Knockmill, Tunbridge Wells, Headley, Claygate, Richmond Park, and Harefield were all visited. Those to Abbey Wood and Headley were joint meetings with the Ecology Section.

Field Work. The investigation of temporary geological sections by members has continued and reports for the year will be found elsewhere in this volume. It was decided late in the year to extend the Section's field work to embrace (1) Examination in detail of certain selected exposures and (2) Review and Report on the state of scheduled geological Reserves.

The thanks of the Section are due to those geologists who so willingly conducted field meetings and to the owners of quarries and works for permitting the Society to visit their properties.

C. P. Castell, *Chairman.* B. Ainsley, *Secretary.*

Ornithological Section.

Membership has continued to increase and now totals 828, including 79 Country Associates, 21 School Associates, 15 Branch Associates, and 4 Affiliated Societies.

Owing to the increase in membership it became necessary this year to hold all indoor meetings in the lecture theatre at Keppel Street or in a hall having similar accommodation. Three meetings were attended by well over 200 members, while average attendance was 138.

Of the 11 indoor meetings arranged, one was a general meeting devoted to a preliminary report of the London Starling Inquiry. Sectional meetings were arranged on ten evenings at which the following lectures were given: Dr. David Lack on "Visible Migration through England and through the Pyrenees", Dr. Bruce Campbell on "The Pied Flycatcher and other nest-box species". The talk on "The Learning Abilities of Birds" had to be cancelled owing to the illness of Dr. Thorpe, and in its place two colour films, on Minsmere and the Avocet, made for the Royal Society for the Protection of Birds, were shown by Mr. P. E. Brown and Miss Davies. One evening was devoted to a discussion of the work of the Section, and one to short papers by members, at which Mr. Cramp spoke on "A Week's Watching in the Pyrenees", and two colour films loaned by Mr. Holt of Leicester were shown in place of the talk by Dr. Philipson who was unable to be present. Mr. C. W. G. Paulson gave the second of two talks on the identification of waders, and Mr. W. B. Alexander spoke on "Bird Observatories". Dr. Maurice Burton discussed the protection of the Kite, and Canon C. E. Raven spoke on "Early Ornithological Studies".

One meeting was held jointly with the British Trust for Ornithology, the subject being "Starlings" by Dr. Robert Carrick. This meeting was held at The Royal Society of Arts and was followed by a buffet supper. Its success was such that it has been decided to hold another joint meeting with the B.T.O. next year.

During the year the following changes were made in the officers of the Section. Mr. A. Gibbs succeeded Dr. Philipson as Recorder for North of the Thames, and Mr. W. G. Teagle was appointed Recorder for Inner London, an addition made necessary by the great increase in the number of records now being received. Mr. W. D. Melluish and Mr. R. H. Ryall retired from the Committee under the rules and Mr. B. A. Richards resigned. Mr. J. F. Burton, Mr. D. Goodwin, Mr. H.

F. Greenfield and Mr. C. A. White joined the Committee after a ballot at the Annual General Meeting.

Fifty-four field meetings including four coach trips were held this year. Average attendance was 21. There is a need for more members to volunteer as leaders, particularly in Essex.

Increased interest in the Reading Circles is shown by the greater number of members who now subscribe to *British Birds, The Scottish Naturalist* and *The Auk.* It was not possible to circulate a second copy of *The Ibis* and the readers of this journal dropped to 18. *Bird Banding* continues to be received by 16 members.

The number of books borrowed from the library showed a rather surprising decrease of 20%, due in part, perhaps, to the fact that fewer meetings were held at Keppel Street. Eleven books were added during the year.

The collection of skins was increased by 14 including a Rosy Pastor from Barn Elms Reservoir presented by Dr. A. G. G. Thompson, a Coot from St. James's Park presented by Mr. T. Sayers, and Chough, Redwing and Rock Thrush received from the Bird Room at the Natural History Museum. Mr. C. A. White completed the sorting and cataloguing of the Egg Collection which numbers 2289 specimens. While the collections have been used by many members, lack of storage space and limited facilities for examination of specimens have proved a handicap.

The number of birds ringed during the year 1950/51 was 4,112 of 68 species by 38 ringers. Among the more interesting recoveries were Black-headed Gull ringed by B. A. Richards in Kensington Gardens 18th December 1946 and recovered at St. Albans with a broken wing on 19th March 1951, Black-headed Gull ringed at the Round Pond by T. L. Bartlett on 29th December 1949 and found dead at Korsor, Zealand, on 29th March 1951, Black-headed Gull ringed by T. L. Bartlett in St. James's Park on 5th January 1951 and recovered at Neustadt near Lubeck on 1st July 1951, Whitethroat ringed by T. L. Bartlett at Ruislip on 6th July 1950 recovered Cherbourg 6th May 1951, Kestrel ringed as a nestling in Richmond Park by R. W. Hayman on 15th June 1948 and shot at St. Aldwyns, Glos., on 29th May 1951.

Preparation of material for the book on "The Birds of the London Area, 1900-1950" was virtually completed. The writing of the sections into which the book will be divided was apportioned among those members who have been asked to do the work. A date for publication cannot yet be given but discussions with publishers have already been undertaken.

The reprinting of the Field List Cards was completed. The cost was defrayed by loans from a number of members who volunteered sufficient funds. All members have now been repaid in cash or in kind. Miss Diana Syms has now taken over the handling of the cards from Mrs. Parkinson.

The *London Bird Report,* No. 16, will contain a number of papers dealing with field work undertaken by members. Here it may briefly be stated that the Section continued the work of previous years, namely the complete census of Black Redstarts, Great Crested Grebes, Herons and Little Ringed Plovers in the Society's area. The Gravel Pit Inquiry was closed in March and a report is being prepared. The London Starling Inquiry was continued for the third year, and the winter census of duck at certain waters in the area was again conducted in co-operation with the International Wildfowl Inquiry. A watch on autumn passerine migration across central London, which had been begun in 1949 and continued in 1950 was developed this year so that several observers are now making frequent observations at the same times from selected points in the central area.

E. R. PARRINDER, *Chairman*. L. BAKER, *Secretary*.

Ramblers' Section.

The membership of the Section is now 79 and the average attendance of this year's outdoor meetings has been twelve. Two indoor meetings, one General and one Sectional, have been held, the Speaker for the former being Mr. Brian Vesey-FitzGerald, F.L.S., who gave an interesting talk on "Gypsies", based on his personal acquaintance with them; for the Sectional meeting, Mr. G. R. Mitchell, representing the Ramblers' Association, gave an account of his Association's activities, and illustrated his talk with lantern views of places of interest to ramblers.

Of the excursions arranged in the year's programme have been fourteen to the undermentioned places:—

THE HORNIMAN MUSEUM, DENMARK HILL, for farm and domestic implements and the aquarium.

THE STAINED GLASS STUDIOS OF WILLIAM MORRIS SINGER & CO., WESTMINSTER, where designs are prepared and glass painted for subsequent firing.

KEN WOOD HOUSE AND GROUNDS. (A wet day).

WINCHESTER, including the Cathedral, College, Hospital of St. Cross, Castle and West Gate Museum. On this Easter week-end excursion, March 23rd-26th, the first Swallows and Martins of the year were observed during a river walk by the Itchen, also Butter-bur and Hellebore amongst early spring flowers, and three species of butterflies.

HAM HOUSE AND GROUNDS. (A wet day).

CHALFONT ST. GILES AND ST. PETER, including a visit to Milton's Cottage.

THE ROYAL HORTICULTURAL GARDENS AT WISLEY, SURREY.

WOLDINGHAM and neighbourhood.

REIGATE AND BOXHILL (not completed owing to a heavy thunderstorm).

ST. ALBANS, including a visit to the Cathedral and Roman Theatre. On this occasion a member picked up a flint implement in a ploughed field; this has been identified at the Natural History Museum as possibly belonging to the Neolithic or Bronze Age.

ALBURY PARK, including the House and Grounds and ALBURY OLD CHURCH; a casual inspection was made of the interesting village and church of Shere, passed en route to Gomshall.

EYNSFORD and neighbourhood.

MESSRS. WILLIAM MORRIS SINGER & CO. STAINED GLASS WORKS AT STOKE NEWINGTON (a follow-up of the Westminster Studio visit). Here the painted glass is fixed and finally leaded and packed for export.

THE GUINNESS BREWERY AT PARK ROYAL.

Unfavourable weather was responsible for a small attendance at some meetings. Epping Forest in November had to be abandoned owing to wet weather, but on fine days the attendance has been good, and on two occasions included members of B.E.N.A.

Members of the reading circle have received "The Countryman", "Out of Doors" and the "Journal of the Society for the Preservation of Footpaths, Commons and Open Spaces".

From the small balance of payments made by subscribers to these publications, four 1 in. ordnance maps of parts of the Home Counties have been purchased and presented to the library.

HERMAN SPOONER, *Chairman*. R. C. HODGSON, *Secretary*.

Additions to List of Members

(From 4th September 1951 to 8th April 1952.)

Members:

(The prefix H denotes membership of the Southwest Middlesex Group)

Allen, Miss N., 38 Greenway, Totteridge, N.20. (Arch., Orn., R.)
H Anderson, A., 725 Bath Road, Hounslow, Middx.
H Bachrach, Mrs. Helen V., 44 Sutton Lane, Hounslow, Middx. (Bot., Ent., Orn.)
Bailey, J. S., Perry Down Cottage, Eynsford, Kent. (Herp., Orn.)
H Bamford, T. W., Borough Road College, Isleworth, Middx. (Geol.)
Bancroft, F., 24 The Drive, Goffs Oak, Waltham Cross, Herts. (Bot., Ent., Orn.)
Banfield, J. G., 148 Edenbridge Road, Bush Hill Park, Middx. (Arch., Orn.)
Barker, Miss R., Copper Hall, Watts Road, Thames Ditton, Surrey. (Ent., Orn.)
Barrett, Miss M. A., 24 Ennismore Gardens, S.W.7. (Arch.)
Bass, H. G. M., 43 Oakwood Avenue, Beckenham, Kent. (Orn.)
Bates, W., The Limes, Fitzroy Park, Highgate, N.6. (Orn.)
Bayliss, Miss K. E., 27 Theobalds Road, Leigh-on-Sea, Essex. (Bot., Ecol.)
Bedford, J., 6 Lordship Park, Stoke Newington, N.16. (Bot., Orn.)
Bedworth, Miss M. C., 9 Ranworth Mansions, 23 Compayne Gardens, N.W.6.
Bennett, W. H., 7a Blomfield Place, Paddington, W.2. (Bot., Orn.)
Berry, J. F., 23 St. Peter's Avenue, Woodford New Road, Walthamstow, E.17. (Orn.)
Bethune, A., 21 Victoria Grove, W.8. (London History, Orn.)
Blachford, K. C., 26 Fryston Avenue, Croydon, Surrey. (Orn.)
Blake, Mrs. B. M., 251 Latymer Court, Hammersmith Road, W.6. (Orn.)
Bourne, W. R. P., Abernethian Room, St. Bartholomew's Hospital, E.C.1. (Orn.)
Boyle, Lt.-Colonel C. L., 34 Steeles Road, Hampstead, N.W.3. (Wild Life Preservation.)
Bronner, Miss E., 171 Holly Lodge Mansions, Highgate, N.6. (Arch., Orn.)
Brown, Miss E. A., 78 Cheviot Road, West Norwood, S.E.27. (Bot., Ecol., Ent., Orn.)
Brown, Miss M. M., 22 Elmwood Avenue, Harrow, Middx. (Geol.)
Bruhn, J. F. W., 25 Hill Top, Golders Green, N.W.11. (Orn.)
H Buck, J. W., 185 Whitton Dene, Isleworth, Middx. (Arch., Geol.)
Burness, G. F. G., 38 Wellhouse Road, Beckenham, Kent. (Orn.)
Burton, P. J. K., 23 Cornwall Road, Stroud Green, N.4. (Orn.)
Bushby, E. D., 45 Cleveland Gardens, Barnes, S.W.13. (Orn.)
Carter, Miss D. M., Boyle Cottage, Church Lane, Thames Ditton, Surrey. (Orn.)
Chapman, E. C., 4 Malbrook Road, Putney, S.W.15.
Chapman, R. F., F.R.E.S., 16 Buckhurst Way, Buckhurst Hill, Essex. (Ent.)
Charity, G. B., 28 Belgrave Court, Chiswick, W.4. (Orn.)
Clark, Miss M., 9 Downside Crescent, N.W.3. (Arch.)
H Claxton, G., Massapeag, The Creek, Sunbury-on-Thames, Middx. (Geol.)
Cole, R. J., Woodlands, Ditton Hill, Long Ditton, Surrey.
Combes, Mrs. J. D., 22 Russell Road, Mitcham, Surrey. (Orn.)
Comerford, J., Flat 8, 85 West Hill, Putney, S.W.15. (Orn.)
Cope, J. L., 62 Westover Road, Wandsworth Common, S.W.18.
H Cotton-Sims, L. J., 33 Heath Road, Hounslow, Middx. (Orn.)
Cox, D. A., 45 Cumnor Road, Sutton, Surrey. (Geol., Orn.)
Cubitt, S., 58 Rickmansworth Road, Pinner, Middx. (Orn.)
Daly, Mrs. D., Lincoln House, 7 Basil Street, S.W.3. (Orn.)
H Daniels, Miss E. Y., 131 Bulstrode Avenue, Hounslow, Middx. (Bot., Orn.)
Dann, H., 25 Muswell Hill Road, N.10. (Bot., Orn.)
Davidson, A. F., Fairmead, Waterside, Lingfield, Surrey. (Orn.)
Davis, J. E. V., 38 Broadfields Avenue, Winchmore Hill, N.21. (Ent.)
de Jonge, D., litt. drs., sociol. drs., 38 Fordwych Road, N.W.2. (Nature Conservation, Orn.)
H Dillingham, J. E., 12 Ivanhoe Road, Hounslow, Middx. (Bot., Orn.)
H Dobson, Mrs. B. O., 11 Widmer Court, Vicarage Farm Road, Hounslow, Middx. (Bot., Orn.)

H Dowling, Miss M. L., 31 Windsor Drive, Ashford, Middx. (Bot.)
English, Miss M. D., Studio H, 416 Fulham Road, S.W.6.
H Everitt, E., 66 Wood Lane, Isleworth, Middx.
Feltham, C. B. J., 5 Boscastle Road, N.W.5. (Orn.)
Flowers, Miss M. J., 95 Gower Street, W.C.1. (Orn.)
Forbes-Watson, Miss A., 2 Salisbury Road, Banstead, Surrey. (Orn.)
Freeman, W., A.M.I.Struct.E., M.Inst.W., 21 Pemberton Avenue, Gidea Park, Essex. (Geol.)
Friese-Greene, A. W., 11 Oakwood Court, Bromley Road, Beckenham, Kent. (Orn.)
Friese-Greene, Mrs. J., 11 Oakwood Court, Bromley Road, Beckenham, Kent. (Orn.)
H Frostick, H. R., 92 Greencroft Road, Heston, Middx. (Bot.)
Garstang, J., 73 The Avenue, Pinner, Middx. (Orn.)
H Germany, R. J., 49 Elmer Gardens, Isleworth, Middx. (Orn.)
Gooden, Miss R. M., 20 Humphry Road, Sudbury, Suffolk. (Bot.)
Gray, Miss A. E., "Ingham", 164 Dorset Road, Merton Park, S.W.19. (Bot., Orn.)
Gray, Miss V., 14 Westmorland Road, Barnes, S.W.13. (Orn.)
Green, Miss E. B., 28 Lyndhurst Road, N.W.3. (Ecol., Orn.)
Hall, Mrs. J. F., 7 Kidbrooke Grove, Blackheath, S.E.3. (Bot.)
Hall, P. C., 7 Kidbrooke Grove, Blackheath, S.E.3. (Bot.)
Harris, Mrs. D. M., 41 Woodside Road, Woodford Green, Essex. (Orn.)
H Harrison, S. G., 73 Court Way, Twickenham, Middx.
Hawkes, Miss J. M., 17 Bramley Road, Cheam, Surrey. (Orn.)
Hazlewood, A. C., "The Two Steps", Lennard Close, West Wickham, Kent. (Ent., Orn.)
Head, Miss M. C., 110 Chestnut Rise, Plumstead, S.E.18. (Orn.)
H Hebden, F. S., Redlees Cottage, Worton Road, Isleworth, Middx. (Bot.)
H Hebden, Mrs. R. J., Redlees Cottage, Worton Road, Isleworth, Middx. (R.)
Hemsley-Hall, Squadron Leader H. S., Officers' Mess, R.A.F., Uxbridge, Middx. (Orn.)
Henderson, Mrs. F. T., 29 The Avenue, Bedford Park, W.4. (Orn.)
Henderson, L. B., 29 The Avenue, Bedford Park, W.4. (Orn.)
Herron, Mrs. M. A., 11 Queen's Gate Place, S.W.7. (Orn.)
Hopwood, Brig. J. A., D.S.O., Flat 3, 30 The Little Boltons, S.W.10. (Orn.)
Hori, J. N., 66 Barriedale, New Cross, S.E.14. (Orn.)
Isherwood, Miss E. M. C., 26 White Post Hill, Redhill, Surrey. (Bot.)
Jones, Miss A. H., 47 Ladysmith Road, Enfield, Mddx. (Arch., Bot., Orn., R.)
Keon, S., 106 Kenilworth Avenue, Wimbledon Park, S.W.19. (Orn.)
Lacklison, J. D., Melvin Hall, Golders Green Road, N.W.11. (Orn.)
Lacklison, Miss M., 106 Park Road, Hampton Hill, Middx. (Orn.)
Lawfield, W. N., 345 South Lane, New Malden, Surrey. (Bot.)
Lewis, G. L., Culmstock, 92 Twickenham Road, Isleworth, Middx. (Orn.)
Lloyd, E. G., 53 Haslemere Road, Thornton Heath, Surrey. (Bot.)
Lovell, R. J., 73 Beech Hall Road, Highams Park, E.4. (Orn.)
Maclaren, R. G. C., Flat 70, 6 Hall Road, N.W.8. (Orn.)
McLay, Mrs. I., 33 Village Way, Pinner, Middx. (Orn.)
McLay, J., 33 Village Way, Pinner, Middx.
H McMullen, Miss W. M., 2 Rosary Gardens, Ashford, Middx.
Mansfield, H. W., Friars' Crag, King's Road, Orpington, Kent. (Orn.)
Mansfield, Miss S. J., Friars' Crag., King's Road, Orpington, Kent. (Bot., Orn.)
Martin-Clarke, Mrs. D. E., The Penn Club, 22 Bedford Place, W.C.1. (Orn.)
H Mather, Miss J., 42a Cole Park Road, Twickenham, Middx. (Bot., Ecol., Zoo.)
Maunder, Miss O., 30 Victoria House, South Lambeth Road, S.W.8. (Orn.)
May, R. H., 8 Silverton Road, Hammersmith, W.6. (Orn.)
May, Mrs. W. F.. 8 Silverton Road, Hammersmith, W.6. (Orn.)
Meade, M. J., British Museum (Nat. Hist.), Cromwell Road, S.W.7. (Geol.)
Meerendonk, Mrs. M. L., "Senga", 66c Norbiton Avenue, Kingston, Surrey. (Orn.)
H Minihane, M. J., 75 Wood Lane, Isleworth, Middx.
Moyle, B. V., 22 Embercourt Road, Thames Ditton, Surrey. (Orn.)

Noakes, Miss D. N., 4 Landland Gardens, Hampstead, N.W.3. (Ecol., Orn.)
Osborne, Miss J., 16 North Drive, Ruislip, Middx. (Orn.)
Padwick, H. N., 13 Lawrence Road, Pinner, Middx. (Orn.)
Parslow, J. L. F., 66 Mansfield Hill, Chingford, E.4. (Orn.)
H Parsons, L. E., 19 Alexandra Gardens, Hounslow, Middx. (Geol.)
Phillips, A., Clarendon House, Granville Park, S.E.13. (Orn.)
Pickess, B. P., 23 Pembroke Road, Ruislip, Middx. (Orn.)
H Pierce, C. W., 125 Heath Road, Hounslow, Middx. (Arch., Bot., Ent.)
Pimm, F., 12 Montem Road, Forest Hill, S.E.23. (Orn.)
Powell, Miss B. M., 16 Cardinal's Walk, Hampton, Middx. (Orn.)
Prevost, Miss C. A., 'Trevena'', 94 Great North Way, Hendon, N.W.4. (Ent., Orn.)
Purry, Miss J., Franklin House School, Bowes Park, N.22. (Orn.)
Radford, F. W. P., 9 Pinewood Close, Shirley, Surrey. (Orn.)
Rampling, W. A., 17 Prebend Gardens, Chiswick, W.4. (Orn.)
Richards, Miss C. L. C., 88 Gloucester Court, Kew Gardens, Richmond, Surrey. (Bot., Ecol., Orn.)
Robins, Miss M. E., 8 Burnt Ash Villas, Effingham Road, Lee, S.E.12. (Bot., Ecol., Orn.)
Rothschild, Miss B., 20 Redford Avenue, Wallington, Surrey. (Orn.)
St. Barbe, Miss O., 3 Grove Terrace, Highgate Road, N.W.5. (Orn.)
St. Hill, Miss M. M., 19 Holroyd Road, Putney, S.W.15. (Orn.)
Sandy, Miss M. L. M., 136 Maidstone Road, N.11. (Arch., Ecol., Orn.)
Scholes, R. T., 70 Cornwall Gardens, S.W.7. (Bot., Ecol., Ent., Orn.)
Scott, G. L., 103 Royal Road, S.E.17. (Bot., Ecol., Orn.)
Seeds, Sir Wm., K.C.M.G., 99 North Gate, N.W.8
Seeds, Lady, 99 North Gate, N.W.8.
Selby, C., 35 St. Ronan's Crescent, Woodford Green, Essex. (Bot.)
Sharples, R. O., "Hey Tor", 80 Beaumont Avenue, St. Albans, Herts. (Bot.)
H Shelmerdine, Miss S. A., 7 Alderney Avenue, Lampton, Hounslow, Middx. (Bot., Zoo.)
H Shinn, Miss P., 5 Bramley Close, Whitton, Middx.
Slack, C. M., 31 Manor Road North, Esher, Surrey. (Bot., Geol.)
Slack, Mrs. W., 31 Manor Road North, Esher, Surrey.
H Small, Miss J., 13 Woodfield Crescent, Ealing, W.5. (Bot., Ecol., Ent., Orn.)
H Small, W. G., 13 Woodfield Crescent, Ealing, W.5.
Smith, P. G., 27 Beatrice Road, Southall, Middx.
Spence, S. J., "Almaden", Woodside Avenue, Esher, Surrey.
Spencer, R., 171 Victoria Road, Romford, Essex. (Orn.)
Spiegler, Dr. G., D.Phil., F.Inst.P., 8 Newton Grove, W.4, and at The Royal Cancer Hospital, Fulham Road, S.W.3. (Orn.)
Spillett, A. W., 5 Temple Close, Bury Green, Cheshunt, Herts. (Geol.)
Stephenson, C. L. C., Clovelly, 27 White Horse Road, East Ham, E.6. (Zoo.)
Stevenson, Miss I., 6 Bridge Gardens, East Molesey, Surrey. (Bot., Orn.)
Stiff, W. J., 4 Mostyn Road, Wimbledon, S.W.19
Stone, Mrs. G. A., 2 Fraser House, Albion Avenue, S.W.8. (Arch., Bot., Ent., Orn.)
H Stratford, Miss J. B. M., 89 Crane Avenue, Isleworth, Middx. (Bot., Ecol., Ent., Zoo.)
Sumpter, Miss E. E., 51 Lancaster Gate, W.2. (Bot., Orn.)
Syms, Mrs. A., 48 Palewell Park, East Sheen, S.W.14.
Templemore, E. H. L., 132 Merton Hall Road, Wimbledon, S.W.19. (Geol., Orn.)
Thackeray, Miss R. M., 3 Collingham Road, S.W.3.
Thompson, D. H., The Haylands, Chigwell, Essex. (Orn.)
Toomer, Miss P., The Limes, Fitzroy Park, Highgate, N.6. (Orn.)
Tucker, Miss N. G., 7 Cleveland Road, Ealing, W.13. (Arch., Orn.)
Underwood, Miss E., 23 Campden Hill Road, W.8.
Wagge, Miss L. E., 192 Lichfield Court, Richmond, Surrey. (Orn.)
Wallace, E. B., 17 Greenway, Totteridge, N.20, Herts. (Orn.)
Waller, Mrs. M., 77 Princes Avenue, W.3. (Orn.)
Waller, S., 14 South Esk Road, Forest Gate, E.7. (Geol., Mycol.)

Watson, Miss B., 5 Top Park, Beckenham, Kent., (Orn.)
Welford, Miss E. K., 48 Kingshill Drive, Kenton, Harrow, Middx. (Arch., Orn.)
Wentworth, Mrs. E. M., B.Sc., 4 Cedar Close, East Molesey, Surrey. (Bot., esp. Fungi.)
H Westrup, A. W., 259 Hanworth Road, Hounslow, Middx. (Bot., Ecol.)
Wheeler, W. J., 1 Belmont Close, Totteridge, N.20. (Bot., Orn.)
White, Miss N. E., 16 Bramham Gardens, S.W.5. (Orn.)
Wilkinson, Mrs. S. M., 26 Golders Rise, Hendon, N.W.4.
Williams, R. E. O., 26 Brampton Grove, Hendon, N.W.4. (Geol., Orn.)
Yeo, F. M. D., "Bellevue", Carshalton Road, Sutton, Surrey. (Ecol., Orn.)
Youle, Mrs. J. E., 58 Grand Drive, Raynes Park, S.W.20. (Orn.)

Affiliated Societies:

Royal Air Force Hornchurch Natural History Society, Aptitude Testing Section, R.A.F., Hornchurch, Essex. (Representative Member : D. J. Barter.)
Ruislip Secondary Modern School Junior Natural History Society (Representative Member : Miss V. Spurdens, 17 The Greenway, Ickenham, Middx.).
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Country Associates:

Attlee, H. G., 4 Combermere Road, St. Leonards-on-Sea, Sussex. (Ent., esp. Odonata, Orn.)
Boswall, J. H. R., 21 Preston Road, Brighton 7, Sussex. (Orn.)
Collins, Mrs I. J., Russet Cottage, Station Road, Effingham, Surrey. (Bot., Ecol., Orn.)
Course, H. A., Clock House, Royston, Herts. (Orn.)
Goodliffe, F. D., Whitelands (Lord Wandsworth College), Long Sutton, Basingstoke, Hants. (Ent.)
Maundrell, Miss B. P., Homeleigh, Chapel Lane, Great Wakering, Southend-on-Sea, Essex. (Orn.)
Partridge, Miss M. R., Beaumont, Amersham, Bucks. (Orn.)
Pilcher, E. J., 52 Albert Road, Hythe, Kent. (Ent., Orn.)
Roberts, Miss M. W. E., Temporary address :—204 Croydon Road, S.E.20. (Bot., Ecol.)
Scott, T. B., "Garswood", Reynolds Road, Beaconsfield, Bucks. (Orn.)
Thomas, Mrs. P. I., The Spinney, Eastwick Drive, Great Bookham, Surrey. (Bot., Ecol., Ent., Orn.)
Younghusband, R. H., No. 2 C.A.A.C.U., Little Snoring Aerodrome, near Fakenham, Norfolk. (Bot., Geol., Orn.)

School Associates:

Austin, B. P., 33 Natal Road, Streatham, S.W.16. (Orn.)
H Bamford, Miss J., 51 Park Close, Hounslow, Middx. (Orn.)
H Carrick, Miss S. M., 17 Brandon Road, Norwood Green, Southall, Middx. (Orn., R.)
H Clutterbuck, A., 73 Linkfield Road, Isleworth, Middx. (Zoo.)
Garr, J. J., 126 Longhill Road, Catford, S.E.6.
H Hayward, A. F., 150 Ash Grove, Heston, Middx. (Ecol.)
Heissig, H. N., 46 Colin Crescent, Hendon, N.W.9. (Orn.)
Knill, J. L., 8 Croham Valley Road, South Croydon, Surrey. (Geol.)
Lord, J. C., 25 Weighton Road, Harrow Weald, Middx. (Orn.)
H Moore, Miss J. O., 55 Heston Road, Lampton, Hounslow, Middx. (Bot., Ent., R.)
H Mugford, D. K., 43 Dene Avenue, Hounslow West, Middx. (Orn.)
H Newman, Miss M. D., 14 Lampton Avenue, Hounslow, Middx. (Bot., Orn., R.)
H Pierce, Miss M. N., 125 Heath Road, Hounslow, Middx. (Bot.)
Powne, Miss G. M., "Chardbourne", 58 Belmont Road, Bushey, Herts. (Orn.)
H Preston, D. A., 206 Staines Road, Laleham, Middx. (Orn.)
Shepherd, I. S., 173 Rye Lane, Peckham, S.E.15. (Ent., Orn.)
H Wright, Miss S. E., 26 Stucley Road, Osterley, Hounslow, Middx. (Bot., Orn., R.)
Walthew, Miss S., Copinsay, East Common, Harpenden, Herts. (Orn.)

HYPERICACEAE

HYPERICUM L.

H. Androsaemum L. *Tutsan.* Woods and thickets. Rare. V.-c. 16. Chislehurst; *W.W.* Hayes Old Rectory, a weed, 1938; *D.McC.* Swanscombe Wood, 1946; Darenth Wood, 1951; *F.R.* V.-c. 17. Near Limpsfield Chart, 1923; *R.W.R.* V.-c. 18. Theydon; *L.B.H.* Golding's Hill, Loughton, several plants; *C.N.* V.-c. 21. Mimmshall Wood, 1908, *C.B.G.*; *Hb.S.L.B.I.* Old Park Wood, Harefield, rare, 1942; hedgebank near Hounslow Heath, probably an escape from cultivation, 1946; *D.H.K.* Whitewebbs Park, Enfield, 1947; *L.J.J.* V.-c. 24. Black Park, 1949; *L.N.H.S. Excursion.*

H. elatum Ait. Alien. Canary Islands. Garden escape. V.-c. 17. Limpsfield Common, *R.W.R.*; *Lond. Nat.*, *18*, 65 (1939); *P.H.C.*; *Hb.L.N.H.S.*

H. calycinum L. *Great St. John's Wort, Rose of Sharon.* Alien. A native of Europe now naturalised as a garden escape on railway banks, in woods, copses and plantations, and by roadsides and on hedgebanks. Not common. V.-c. 16. Abundant by Mount's Road, Greenhithe; *F.R.* V.-c. 17. Railway banks between Leatherhead and Box Hill, in profusion; *R.W.R.*; 1951; *J.E.L.* Top of Box Hill, 1923, *J.E.L.*; *Hb.L.* Near Cobham, 1927; *L.J.T.*; 1939, *P.H.C.*; *Hb.L.N.H.S.*; 1950; *L.N.H.S. Excursion.* Brewer Street, 1939; *P.H.C.* V.-c. 20. Rubbish-tip, Bayford, 1937, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Edge of Hounslow Heath, by Staines Road, 1949, known here for nearly twenty years; *H.B.*

H. montanum L. *Mountain St. John's Wort.* Dry calcareous places. Rare. V.-c. 16. Chislehurst; S.W. of Keston, two localities; *W.W.* Elmstead Lane, Bickley, 1944; The Thrift, near Greenhithe, 1945; Darenth Wood, 1946; *F.R.* Abbey Wood, 1951; *G.A.M.* V.-c. 17. Headley, 1926; Tandridge Hill Lane, 1928; *R.W.R.* Box Hill, 1927, *J.E.L.*; *Hb.L.* Croham Hurst, near Croydon, 1899, *L.B.H.*; *Hb.H.*; 1924, *J.E.L.*; *Hb.L.* Fetcham Downs, 1932; Sanderstead Hill, 1943, *P.H.C.*; *Hb.L.N.H.S.*

H. hirsutum L. *Hairy St. John's Wort.* Woods, downs, railway banks and rough grassy places. Locally frequent. Rather common on calcareous and clay soils in v.-cc. 16, 17 and 21, from which there are many records. V.-c. 18. Epping, 1896, *E.L.S.*; *Hb.L.N.H.S.* Ongar Park Wood, 1909; *R.W.R.* Abridge; *P.H.C.* Curtis Mill Green, near Abridge, 1951; *B.T.W.* Tawney Hatch, 1926; *L.J.T.* V.-c. 19. Bury Lane, Epping, 1951; *J.R.* Latton Park, 1951; *B.T.W.* V.-c. 20. Wormley West End, 1922; *L.J.T.* Hertford; Rickmansworth; Springwell, 1949; *D.H.K.* V.-c. 24. Railway banks, Denham, 1950; *D.H.K.*

H. pulchrum L. *Small, or Slender St. John's Wort.* Dry woods, heaths and railway banks. Locally plentiful. Frequent and well distributed in v.-cc. 16 and 17, especially off the chalk. V.-c. 18. Highams Park, 1901; Ongar Park Wood, 1909; *R.W.R.* Chingford; *E.M.D.*

Between Wake Arms and Theydon, 1909; *C.L.C.* High Beech, 1910, *P.H.C.*; *Hb.L.N.H.S.* Epping Forest, 1926; *B.T.W.* V.-c. 19. Epping Lower Forest, 1951; *J.R.* teste *B.T.W.* V.-c. 20. Wormley West End, 1908; North Mimms, 1913; Essendon; Bricket Wood, 1920; *P.H.C.* Broxbourne, 1909; *C.L.C.* V.-c. 21. Uxbridge Common, 1920; *P.H.C.* Harefield; Harrow Weald Common; *C.S.N.*; still at the last two places, 1951; Ruislip; Stanmore Common; Mimmshall Wood; Highwood and Deacons Hills, 1932-51; *D.H.K.* Coldfall Wood, Highgate; *L.B.H.* Copse Wood, Northwood; *B.W.* V.-c. 24. Near Fulmer; Denham; *P.H.C.* Black Park, 1931; *J.C.R.*; 1950; *D.H.K.*

H. TETRAPTERUM Fries, H. QUADRANGULUM auct. *Square-stalked St. John's Wort.* Stream and ditch sides, pond verges, marshes and wet places. Not common. V.-c. 16. Westerham, 1921; *R.W.R.*; 1937; Chislehurst Common, 1933; *P.H.C.* Holwood Park; Riverhead; Darenth; Brasted; *F.R.* V.-c. 17. Oxted Mill, local, 1919; Limpsfield; *R.W.R.* Wray Park, 1931; Chessington, 1933; *P.H.C.* Ashtead, 1944, *P.H.C.*; *Hb.L.N.H.S.* By Thames, East Molesey, one plant, 1944; *B.W.* V.-c. 18. Ongar Park Wood, 1909; Highams Park; Lambourne; *R.W.R.* Shenfield; Aveley; *P.H.C.* Chingford; *E.M.D.* Woodredon Hill, 1927, *B.T.W.*; *Hb.L.N.H.S.* Near Wake Arms; *C.N.* Cuckoo Pits, Epping Forest, *J.H.G.P.* & *J.R.*; *Lond. Nat.*, *24*, 45 (1945). Loughton, 1951; *R.M.P.* V.-c. 19. Epping Lower Forest, 1951; *J.R.* teste *B.T.W.* Latton Park, 1951; *B.T.W.* V.-c. 20. Watford, 1906, *C.S.N.*; *Hb.L.N.H.S.* Wormley West End, 1908; Bricket Wood; Park Street; Bayford; Essendon; Broxbourne; *P.H.C.* V.-c. 21. Near Uxbridge, 1871, *F.J.H.*; *Hb.Mus.Brit.* Kingsbury, 1910; Stanwell, 1913; *P.H.C.* Thames bank, near Staines, 1942, *J.E.L.*; *Hb.L.* Between Hampton Court and Kingston Bridge, 1943; *B.W.* Harefield; Cowley; Stanmore and Finchley Commons; South Mimms; Yeoveney; Perivale, 1944-51; *D.H.K.* Whitewebbs Park, Enfield; *L.J.T.* Bombed site, Ebury Street, S.W.1; *D.McC.* V.-c. 24. Near Colnbrook, 1910; *J.E.C.* Black Park; Iver; *D.H.K.*

H. DUBIUM Leers, H. QUADRANGULUM auct. *St. Peter's Wort.* Wood borders, thickets and shady places. Very local. V.-c. 17. Buckland Hills, 1917; *E.B.B.* conf. *C.E.S.* Edge of Walton Heath, 1930; *E.C.W.*; *Hb.L.* Wimbledon Common, 1938; *C.A.* V.-c. 18. Near Woodhatch, 1909, *C.N.*; *Hb.L.N.H.S.* Thorndon Park; *R.W.R.* Roadside, Theydon Mount, 1951; *R.M.P.* V.-c. 24. Black Park, 1949; *L.N.H.S. Excursion.*

×PERFORATUM. V.-c. 17. Chipstead Valley, abundant, 1941, *J.E.L.*; *Hb.L.* The occurrence of a puzzling *Hypericum* with characters of both H. PERFORATUM and H. DUBIUM was first noticed by E. C. Wallace, who found it in a gravelly field near Perrott's Farm, Burgh Heath, in the Chipstead Valley in 1929. See *Watson B.E.C. Rep. 1930/31*, 63, and *B.E.C. Rep. 1932*, 431. It was later found that large colonies of similar plants were distributed for about a mile along the valley but most of them were destroyed by the levelling and ploughing which took place in 1942 and 1943 to bring more land into (often temporary) cultivation. No doubt these plants are one of the forms of H. DESETANGSII Lamotte, which is now regarded as a hybrid of the parentage stated, but they differ from much of the material distributed or illustrated from elsewhere under that name. J.E.L.

H. PERFORATUM L. *Common St. John's Wort.* Heaths, downs, railway banks and grassy places. Common and well distributed. The var. ANGUSTIFOLIUM DC. is noted from v.-c. 17. Box Hill, 1946; *J.E.L. & D.H.K.* V.-c. 21. Harefield, 1939; Springwell, 1944; *D.H.K.* The var. LATIFOLIUM Koch was found in v.-c. 16. W. of Eynsford, 1923; *W.W.* The specimen had leaves measuring 20×11 mm.

H. HUMIFUSUM L. *Trailing St. John's Wort.* Heaths, railway banks and grassy places. Common and widely dispersed throughout the area. A plant collected from v.-c. 16. Farleigh; *W.W.*, is referred to var. GENUINUM Rouy & Fouc. forma LAXUM Pugsl.

H. ELODES L. *Bog St. John's Wort.* Bogs. Very local. V.-c. 16. Chislehurst; *W.W.* Keston Bog, 1917; *P.H.C.*; 1924, *J.E.L.*; *Hb.L.*; 1950; *J.D.L.* V.-c. 17. Black Pond, Esher Common, 1915; *E.B.B.*; 1950; *L.N.H.S. Excursion.* West End Common, Esher, 1949; *B.W.* Sheen Common, 1933; *C.A.* V.-c. 18. Near Wake Arms; *L.B.H.*; plentiful, 1951; *L.N.H.S. Excursion.* Near Theydon, 1916; *J.A.S.* teste *S.A.* Bog on Jack's Hill, 1926 and 1951; *B.T.W.* V.-c. 19. Bog on Lodge Gates Road, Epping Forest, 1951; *B.T.W.*

MALVACEAE

ALTHAEA L.

A. HIRSUTA L. *Hispid Mallow.* Alien. Europe. V.-c. 18. Dagenham Dock, 1939, *P.H.C.*; *Hb.L.N.H.S.* det. *Kew.*

A. ROSEA (L.) Cav. *Hollyhock.* Alien. S. Europe. A garden outcast which is not uncommon on rubbish-tips and railway banks.

LAVATERA L.

L. THURINGIACA L. Alien. S. Europe. V.-c. 17. Bomb-crater, Brockham Hill, 1948, *J.E.L.*; *Hb.L.*

MALVA L.

M. MOSCHATA L. *Musk Mallow.* Downs, meadows, railway banks, grassy waste places and woodland rides. Rather common, and recorded from all the v.-cc. The var. HETEROPHYLLA Lej. & Court. is reported from v.-c. 16. Near Knockholt, 1940, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 17. Farleigh, 1924, *J.E.L.*; *Hb.L.* Box Hill, 1925; *E.B.B.* V.-c. 21. Near Hounslow Heath, 1947; *D.H.K.* Meadows above the canal, Hanwell, 1947; *F.E.W. & D.H.K.* V.-c. 24. Denham, 1912; *P.H.C.*; 1935, *P.H.C.*; *Hb.L.N.H.S.* Plants with white flowers are recorded from v.-c. 17. Wimbledon Common, 1945; *B.W.* V.-c. 20. Moor Park, 1937; *P.H.C.* V.-c. 21. Uxbridge, 1903; Northwood, 1907; *C.B.G.* Finchley, 1911, *J.E.C.*; *Hb.Mus.Brit.* Hanwell, 1937; *D.H.K.*

M. SYLVESTRIS L. *Common Mallow.* Roadsides, waste ground and railway banks. Common throughout the area. White-flowered plants are reported from v.-c. 17. Towpath between Richmond and Kew, 1950; *B.W.* V.-c. 21. Yiewsley, 1909-14; *J.E.C.* Plants with clear blue flowers were seen in v.-c. 17. Near Cobham Church, 1950; *B.W.*; *L.N.H.S. Excursion.*

M. NEGLECTA Wallr., M. ROTUNDIFOLIA auct., vix L. *Small-flowered Mallow.* Roadsides, waste places, commons and railway banks. Common and well distributed in all the v.-cc.

*M. PUSILLA Sm. & Sow., M. BOREALIS Wallr. Alien. Europe. V.-c. 16. Plumstead Marshes, 1915; *J.E.C.* V.-c. 17. By Mitcham Junction railway station, 1932, *J.E.L.; Hb.L.* Near Kemp's Farm, Buckland, 1949, *J.E.L. & B.M.C.M; Hb.L.* See also *B.S.B.I. Year Book, 1950,* 101. V.-C. 21. Canal path N. of Uxbridge, 1909, *C.S.N.; Hb.L.N.H.S.* Yiewsley, 1909-10 and 1912, *J.E.C.* Leather Lane, E.C., 1950, *J.W. & E.B.Ba.; Hb.Mus.Brit.* V.-c. 24. Near Iver, 1910; *J.E.C.*

*M. VERTICILLATA L. Alien. Europe. V.-c. 17. Waste ground near Kew Bridge, 1943, *B.W.; Hb.W.* det. *N.Y.S.* Kew Gardens, among potatoes, 1943; *B.W.* V.-c. 18. Chigwell Lane, 1907, *C.N.; Hb.L.N.H.S.*

*M. PARVIFLORA L. Alien. Europe. V.-c. 16. Old chalkpit, Green Street Green, Farnborough, 1937, *J.E.L.; Hb.L.* V.-c. 17. Mortlake, 1921-22; *J.E.C.* V.-c. 21. Fortis Green, 1911; Hackney Marshes, 1912 and 1916; Hendon, 1927; *J.E.C.* Yiewsley, 1912, *J.E.C.; Hb.Mus.Brit.* West Ealing, one plant, 1944, *D.H.K.; Hb.K.* det. *N.Y.S.* The var. MICROCARPA (Desf.) Fiori & Paol. is reported from v.-c. 21. Finchley, 1910; Hackney Marshes, 1926; *J.E.C.*

**The alien small-flowered Mallows have been much confused, and changes in nomenclature have increased our difficulties. Some of the records may need revision.*

SIDA L.

S. SPINOSA L. Alien. S. America. V.-c. 21. Forecourt of Soya Foods Ltd., Springwell, 1945, *D.H.K.; Hb.K.*; several plants seen 1946-47; *D.H.K.*

ABUTILON L.

A. THEOPHRASTI Med. *Chinese Jute.* Alien. Mediterranean Region. V.-c. 17. Ham gravel pits, 1948, *J.E.L.: Hb.L.* V.-c. 21. Canal bank, Springwell, one plant, 1945, *B.W.; Hb.K.* About Soya Foods Ltd., Springwell, abundant, 1946-48; *D.H.K.*; one plant, 1951; *J.E.L., D.McC. & D.H.K.* Rubbish-tip, Hanwell, 1946, *D.H.K.; Hb.K.*

HIBISCUS L.

H. TRIONUM L. *Flower-of-the-Hour.* Alien. Europe, etc.. V.-c. 18. Dagenham, 1949; *N.Y.S.* V.-c. 21. Fortis Green, 1909: *J.E.C.* Canal bank near Springwell Lock, one plant, 1945, *D.H.K.: Hb.K.*

TILIACEAE

TILIA L.

T. PLATYPHYLLA Scop. *Large-leaved Lime.* Alien. Europe, including parts of Britain. Planted in woods, plantations, parks and recreation grounds. Not common. V.-c. 21. Syon Park; Hampton Court; Golders Hill Park; Chiswick House grounds; *D.H.K.*

×T. VULGARIS Hayne, T. EUROPAEA auct. *Common Lime.* Alien. Europe. Commonly planted in parks, recreation grounds, plantations, and as a street tree.

T. CORDATA Mill. *Small-leaved Lime.* Alien. Europe, including parts of Britain. Planted in woods, plantations, parks and recreation grounds. Not common. V.-c. 16. Farningham Wood, two trees; *F.R.*; 1950; *L.N.H.S. Excursion.* V.-c. 17. Barnes Common; *P.H.C.* Banks Common, 1927; *E.B.B.* Lane between Dorking Road and Pleasure Pit Road, Epsom, 1943, *A.E.E.*; *Hb.E.C.M.* W. of Buckland, 1950; *B.W. & B.M.C.M.* V.-c. 21. Bushy, Hampton Court, Syon and Osterley Parks; *D.H.K.* Hanger Hill, Ealing, 1946, *F.P.D.B. & D.H.K.*; *Hb.K.* Ken Wood; *H.B.W.*

T. TOMENTOSA Moench., T. ARGENTEA DC. *White Lime.* Alien. S.E. Europe and Asia Minor. Planted in copses, parks and plantations. Not common. V.-c. 16. Copse, St. Mary Cray, 1945; Keston Common, *P.H.C.*; *Hb.L.N.H.S.* det. *Kew.* Orpington Park; *P.H.C.* V.-c. 17. Wimbledon Common, 1938; *C.A.* V.-c. 21 Golders Hill Park; *H.B.W.*

LINACEAE

RADIOLA Hill

R. LINOIDES Roth. *All-seed.* Heaths. Very rare. V.-c. 17. Reigate Heath, 1942; *J.E.L.*; 1950; *B.M.C.M.*

LINUM L.

L. BIENNE Mill. *Narrow-leaved Flax.* Downs and calcareous places. Rare. V.-c. 17. Chalkpits above Oxted, 1924; *R.W.R.* Riddlesdown, 1949; *B.W.* V.-c. 21. Above Harefield Chalkpit, 1947, *B.W.*; *Hb.K.*

L. CATHARTICUM L. *Fairy Flax, Purging Flax.* Downs, heaths, railway banks and dry grassy places. Locally abundant. V.-c. 16. Frequent on the chalk. V.-c. 17. Common on the chalk. Limpsfield Common, local; *R.W.R.* Chertsey Mead, 1945; *B.W.* V.-c. 18. Ongar Park Wood, 1909; *R.W.R.* Noak Hill; Havering; *P.H.C.* Grays, 1910, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. Cassiobury Park; Chandlers Cross; *C.S.N.* Colney Heath, 1913; West Hyde; *P.H.C.* Near Rickmansworth, 1944; *D.H.K.* V.-c. 21. Common on the chalk at Harefield, Springwell and South Mimms. Finchley Common, 1901; *C.S.N.* Warren Gate; *P.H.C.* Stanmore and Harrow Weald Commons; Ruislip; Ickenham; *D.H.K.* Northwood, 1912; *P.H.C.*; 1950; *D.H.K.* Near Littleton, 1945; *B.W.* Bombed site, Great Turnstile Street, W.C.1, 1950; *J.W.* V.-c. 24. Near Langley, 1905; *L.B.H.*

L. USITATISSIMUM L. *Cultivated Flax.* Alien. Africa, etc. Recorded on waste ground and rubbish tips as an escape, or outcast, from cultivation in all the v.-cc. except 19.

GERANIACEAE

GERANIUM L.

G. SANGUINEUM L. *Bloody Crane's-bill.* Alien. Europe, including parts of Britain. Garden escape. V.-c. 21. Waste ground, Uxbridge, 1950; *L.M.P.S.* conf. *D.H.K.*

G. VERSICOLOR L., G. STRIATUM L. *Striated Crane's-bill.* Alien. Europe. Naturalised in woods, plantations and churchyards, and on hedgebanks. Rare. V.-c. 16. Halstead; *Miss Burnaby-Atkins* teste *F.R.*; 1947; *F.R.* V.-c. 17. Reigate Churchyard, 1902; *T.A.D.* Limpsfield Chart; *R.W.R.*; 1938, *J.E.L.*; *Hb.L.* V.-c. 21. Hedgebank near Elstree, 1946, *D.H.K.*; *Hb.K.*

G. PRATENSE L. *Meadow Crane's-bill.* Streamsides, meadows and railway banks. Locally abundant near the Thames, rather rare elsewhere. V.-c. 16. Holwood Park, 1898; *B.T.L.* Meadow by railway at Chislehurst, 1944; *F.R.* Stone; Watling Street, N. of Darenth Wood, 1950; *H.M.P.* V.-c. 17. Frequent, but decreasing, by the Thames from Weybridge to Kew. Putney Heath, 1933; Wimbledon Common; *C.A.* Downside, Cobham, 1924; *L.G.P.* West Heath, Limpsfield, 1924; *R.W.R.* By the Mole in Norbury Park, 1942; *J.E.L.* Banstead, 1942, *A.E.E.*; *Hb.E.C.M.* N. of Betchworth railway station, 1950; *B.W.* Bomb crater (introduced), Brockham Hill, 1948, *J.E.L.*; *Hb.L.* Lane near Leigh Mill Pond, 1949; *J.E.L.* Claygate, 1936, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 18. Strawberry Hill, Epping Forest; banks of Ching near Chingford, 1931; *J.O.B.* Whitehall Plain, 1935; *J.R.* High Beech, 1938, *W.E.G.*; *Hb.L.N.H.S.* V.-c. 21. Common by, and near, the Thames from Staines to Hampton Court. Hayes, 1923; *L.J.T.* Canal bank near Cowley; Uxbridge and Harefield Moors; Yeoveney; railway banks, Poyle to Colnbrook, plentiful; Syon Park, 1944-51; *D.H.K.* Meadow by the Cran, near Hounslow Heath, 1949; *C.E.H.* & *D.H.K.* V.-c. 24. Near Wraysbury Mill, Colnbrook, one large patch, 1903; *C.S.N.*; 1912, *P.H.C.*; *Hb.L.N.H.S.* Plants with white flowers are reported from v.-c. 17. West Heath, Limpsfield, 1924; *R.W.R.*

G. PHAEUM L. *Dusky Crane's-bill.* Alien. Europe. Naturalised in woods, plantations, grassy places, and on hedge banks. Not common. V.-c. 16. Near Crossness Sewage Works, 1927; *H.J.B.* Farnborough; *W.W.*; 1932; *P.H.C.* N. of Brasted; *Miss Burnaby-Atkins* teste *F.R.*; 1947; *F.R.* V.-c. 17. Broome Park, Betchworth, abundant, 1950; *B.M.C.M.* & *B.W.* V.-c. 21. Uxbridge Common, 1906, *C.B.G.*;

Hb.S.L.B.I. Enclosure near Ken Wood House, 1948; *L.C.S.*; 1949; *H.C.H.*; 1950-51; *D.H.K.* The var. LIVIDUM (L'Hérit.) Pers. was found in v.-c. 21. Thicket in Syon House grounds, 1946; *D.H.K.*

G. PYRENAICUM Burm. f., G. PERENNE Huds. *Mountain Crane's-bill.* Downs, commons, hedgebanks, railway banks and grassy places. Locally abundant, and increasing. V.-c. 16. Near Chevening, 1913; *E.B.B.* Near Brasted, 1924; *R.W.R.* Dartford Marshes, 1931; Erith Marshes, 1937; *P.H.C.* Hayes railway station; *J.E.L.* Newington Dump, Sevenoaks, 1951; *D.McC.* V.-c. 17. Weybridge, 1919; *E.B.B.* Hurst Green, Oxted, 1919; *R.W.R.* Near Leatherhead, common, 1922; *L.J.T.*; 1948; *B.W.*; 1951; *J.E.S.D.* Near the railway, Fetcham, 1923; near Slyfield, Grêat Bookham, 1928; *E.B.B.*; 1929; *J.E.L.* Beddington Sewage Farm, in plenty, 1932; *L.P.*; 1950; *R.M.P.* By Epsom Grandstand, 1928; track from Mickleham Downs to Headley, plentiful, 1935-42, *J.E.L.*; *Hb.L.* Wimbledon and Bookham Commons; Ashtead, 1943; *P.H.C.* Tamworth Lane, Mitcham, 1930, *J.E.L.*; *Hb.L.* By the Thames, Kew, 1944; Palewell Common, Sheen, 1945; Richmond Park, 1949; Chipstead railway station, 1950; *B.W.* Near Mitcham Junction railway station, 1916; *J.E.C.*; 1951; *J.D.L.* Dump on Barnes Common, 1948; *B.W.*; 1951; *L.N.H.S. Excursion.* V.-c. 18. Chigwell, 1905; Nettlewell, 1913; *P.H.C.* Highams Park, 1909, *C.N.*; *Hb.L.N.H.S.* V.-c. 19. Near Roydon, 1902; *C.S.N.* V.-c. 20. Near Berry Grove, Watford, 1906, *C.S.N.*; *Hb.L.N.H.S.* Rickmansworth; *C.S.N.* Broxbourne; Bushey; *P.H.C.* Hoddesdon, 1909, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Church End, Finchley, 1906, *L.B.H.*; *Hb.H.* East Bedfont; Northwood; *P.H.C.* Uxbridge Moor, *C.B.G.*; *Hb.S.L.B.I.* Towing-path, Hampton Court, 1931; *L.J.T.*; 1951; *D.H.K.* Hayes, 1923; *L.J.T.* Hanwell, 1932; Harefield and Denham, frequent, 1939-51; Sunbury; Walton Bridge; Staines Moor; Yeoveney; railway banks near Southall; near Hounslow Heath; railway banks, Chiswick to Barnes Bridge, abundant, 1932-51; *D.H.K.* Brentford Cemetery, 1943; *B.W.* V.-c. 24. Dromenagh, near Iver, 1924; *E.B.B.* Denham, 1939-51; *D.H.K.*

The first record for Britain (Hudson, 1762) includes Middlesex stations but it was evidently then rare as the species is one which is not easily overlooked. Until the middle of the 19th century records of the plant were relatively few but since then it has shown a rapid increase, which continues. It seems likely that the species is native in mountainous countries round the Mediterranean and that in Britain, as in northern Europe generally, it has been introduced.

G. COLUMBINUM L. *Long-stalked Crane's-bill.* Downs, grassy places, railway tracks and cultivated ground, rarely off the chalk. Local. V.-c. 16. Keston, 1900; *B.T.L.* Chislehurst; *W.W.* Bexley, 1917; Halstead, 1939; *B.T.L.* Mount's Wood, Greenhithe, 1948-51; *H.M.P.* V.-c. 17. Colley Hill, Reigate, 1917; edge of Banstead Wood, 1924; near Headley, 1919; *E.B.B.*; 1948; *B.W.* Foot of Box

Hill, 1896; *J.E.C.* Downs W. of Oxted, 1925; *R.W.R.* Warlingham, 1925; Buckland Hills, 1927, *J.E.L.*; *Hb.L.* Chaldon, 1935; *P.H.C.* Chipstead Valley, abundant, 1942; *J.E.L.* Betchworth Hill, 1950; *B.M.C.M.* V.-c. 20. Rickmansworth, 1910, *P.H.C.*; *Hb.L.N.H.S.* Bricket Wood; *P.H.C.* V.-c. 21. Above Harefield chalkpit, 1907, *C.B.G.*; *Hb.S.L.B.I.* Above Springwell chalkpit, 1948; *R.A.B.* Railway track between Uxbridge and Denham; railway track, Colnbrook, 1951; *D.H.K.* V.-c. 24. Denham, 1912, *P.H.C.*; *Hb.L.N.H.S.*; 1951; *D.H.K.*

G. DISSECTUM L. *Cut-leaved, or Jagged Crane's-bill.* Hedgebanks, grassy places, cultivated and waste ground. Common throughout the area.

G. MOLLE L. *Dove's-foot Crane's-bill.* Hedgebanks, grassy places, cultivated and waste ground. Frequent in all the v.-cc. The var. GRANDIFLORUM Vis. is recorded from v.-c. 21. Near Stanwell, 1948, *D.H.K.*; *Hb.K.*

G. ROTUNDIFOLIUM L. *Round-leaved Crane's-bill.* Hedgebanks, railway banks, roadsides, waste ground and dry gravelly places. Very local. V.-c. 16. Roadside near Bexley, 1871, *F.J.H.*; *Hb.Mus.Brit.* Darenth; *W.W.* Gravel pit, Stone, 1946; *F.R.*; three patches, 1948-50; *H.M.P.* Erith Marshes, 1951; *J.E.L.*, *B.W.* & *J.C.C.* V.-c. 17. Towpath outside Kew Gardens, a casual plant, 1950; *B.W.*; *R.A.B.* V.-c. 18. Purfleet, 1912, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Railway banks by Barnes Bridge, Chiswick, very abundant, 1939-51; canal path near Harefield, 1945, *D.H.K.*; *Hb.K.*

G. PUSILLUM Burm. f. *Small-flowered Crane's-bill.* Grassy places, hedgebanks, roadsides and cultivated ground on light soils. Rather common, but often overlooked. V.-c. 16. Near Stone, 1886, *F.J.H.*; *Hb.Mus.Brit.* Near Shoreham; *B.T.L.* Dartford Marshes, 1931; *P.H.C.* Hayes Common, 1934; *D.McC.* Erith, 1948; *R.A.B.* V.-c. 17. Mortlake, 1913-16; *J.E.C.*; 1948; *R.A.B.* Near Littleheath, 1915; *E.B.B.* Ham gravel pits, 1934; Ashtead, 1946; *P.H.C.* Weybridge, 1922; *W.W.* Limpsfield, 1921; Shirley, 1922; *R.W.R.* Near Weybridge railway station, 1930; Ham Common, 1942, *J.E.L.*; *Hb.L.* Oxted, 1936; *P.H.C.* Limpsfield, 1929, *R.W.R.*; *Hb.L.N.H.S.* Frequent by the Thames from Kingston to Kew, 1943-49; Wimbledon Common, 1930, *C.A.*; 1946; *B.W.*; 1949; *R.A.B.* V.-c. 20. Near Croxley Mill; *C.S.N.* Hoddesdon, 1910, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Frequent and widely distributed. V.-c. 24. Denham; *D.H.K.*

G. LUCIDUM L. *Shining Crane's-bill.* Walls and dry hedge-banks. Very local. V.-c. 16. Lane between Dartford and Greenhithe, 1886, *F.J.H.*; *Hb.Mus.Brit.* Hayes, 1899; *L.B.H.* Hayes Common; *W.W.*; 1939, *P.H.C.*; *Hb.L.N.H.S.* Gravel pit near Hayes railway station, 1926, *J.E.L.*; *Hb.L.* West Wickham, 1899; *B.T.L.* Abbey Wood, *F.J.H.*; *Fl. Kent*, 78. V.-c. 17. Near Godstone Church, 1924; *R.W.R.*

Reigate Hill, 1932, *E.C.W.*; *Hb.L.* V.-c. 20. Path into Essendon Churchyard, 1920; *P.H.C.* V.-c. 21. Ditch near Brentford, 1871, *F.J.H.*; *Hb.Mus.Brit.* Greenford Churchyard, 1902, *C.B.G.*; *Hb.S.L.B.I.*; 1912; *P.H.C.* Mill Hill, 1909, *P.H.C.*; *Hb.L.N.H.S.*; 1916, *J.E.C.*; *Hb.Mus.Brit.* Near Moorhall, 1915; *L.J.T.*; 1917, *J.E.C.*; *Hb.Mus.Brit* Near Denham, 1944; *D.H.K.* V.-c. 24. Denham, 1913; *P.H.C.* Dromenagh, near Iver, 1924; *E.B.B.*

G. ROBERTIANUM L. *Herb Robert.* Hedgebanks, woods and old walls. Common in all the v.-cc. The var. RUBRICAULE Hornem. is reported from v.-c. 21. Harefield chalkpit, 1948; *D.H.K.*, and white-flowered forms have been found in v.-c. 17. Limpsfield; *R.W.R.* V.-c. 21. Winchmore Hill, 1944-47; *M.A.R.S.S.* Ealing, 1947; *D.H.K.* Perivale Churchyard, abundant; *B.W.*

G. MACRORRHIZUM L. Alien. Europe. V.-c. 21. Disused gravel pit, Hanwell, 1932-35, site now built over; *D.H.K.*

? G. TUBEROSUM L. Alien. S. Europe. V.-c. 21. On towpath near Hampton Court Palace, 1922; *L.J.T.*; still in the same spot, a fine healthy plant in full flower, 1928; *L.J.T.*

G. IBERICUM L. Alien. Caucasus. Garden escape. V.-c. 17. River-wall near Teddington Lock, 1944; *B.W.*; quite naturalised, 1950; *B.W.*

ERODIUM L'Hérit.

E. MOSCHATUM (L.) Ait. *Musk Stork's-bill.* Alien. Europe, including parts of Britain. V.-c. 16. Hextable, 1949, *J.E.L.*; *Hb.L.* Introduced with "shoddy". A form with dissected leaflets was also noticed; *J.E.L.*

E. CICUTARIUM (L.) L'Hérit. *Common Stork's-bill.* Fields, commons and waste places, usually on sandy soil. Locally common. V.-c. 16. Dartford Heath, 1919; *E.B.B.* Hayes Common, 1923, *J.E.L.*; *Hb.L.*; 1936; *P.H.C.* Near Westerham, 1924; *R.W.R.* Swanscombe Marshes, 1938, *P.H.C.*; *Hb.L.N.H.S.* Stone; Dartford, 1948-51; *H.M.P.* V.-c. 17. Common in sandy areas. V.-c. 18. Orsett; Chaldwell, 1913; *P.H.C.* V.-c. 20. Arkley Green, 1912, *P.H.C.*; *Hb.L.N.H.S.* Broxbourne sandpit; *C.S.N.* Rye House; *P.H.C.* Panshanger, 1951; *R.M.P.* V.-c. 21. Yiewsley, 1902-16; Finchley, 1913; Hackney Marshes, 1915; *J.E.C.* West Drayton, 1910, *P.H.C.*; *Hb.L.N.H.S.* Highgate Golf Links, 1919; *C.H.A.* Towpath near Hampton Wick, 1922; *L.J.T.* Disused gravel pit, Hanwell, 1933; railway bank, Brentford, 1951; *D.H.K.* The var. PIMPINELLIFOLIUM (Cav.) Sm. was found in v.-c. 21. Canal path between Cowley and Uxbridge, 1945; *D.H.K.*

E. BOTRYS (Cav.) Bertol. Alien. Mediterranean Region. V.-c. 16. "Shoddy" alien. Hextable, 1948, *D.McC.*; 1949, *J.E.L.*; *Hb.L.*; 1950, *D.McC.*; *Lond. Nat.*, *30*, 4 (1951).

E. CYGNORUM Nees. Alien. Australia. V.-c. 16. "Shoddy" alien. Hextable, 1948, *D.McC.*; 1949, *J.E.L.*; *Hb.L.*; 1950, *D.McC.*; *Lond. Nat.*, *30*, 4 (1951).

TROPAEOLACEAE

TROPAEOLUM L.

T. PEREGRINUM L. *Canary Creeper.* Alien. New Granada. Garden outcast. V.-c. 21. Rubbish-tip, Hounslow Heath, 1951, *D.McC., J.E.L. & D.H.K.; Hb.K.*

T. MAJUS L. *Nasturtium.* Alien. Peru. Garden outcast. V.-c. 20. Rubbish-tip, Wormley West End, 1938, *P.H.C.; Hb.L.N.H.S.* V.-c. 21. Rubbish-tip, Hanwell, 1946, *D.H.K.; Hb.K.*

OXALIDACEAE

OXALIS L.

Dr. D. P. Young has kindly determined a number of specimens, and given helpful advice on this critical genus.

O. ACETOSELLA L. *Wood Sorrel.* Woods, thickets and shady places. Common throughout the area. The var. SUBPURPURASCENS DC. is reported from v.-c. 16. Brasted Hill; *W.W.* V.-c. 21. Old Park Wood, Harefield, frequent, 1945, *D.H.K.; Hb.K.*

*O. CORNICULATA L. Alien. S. Europe, etc. Naturalised on waste ground, and as a persistent garden weed. Not common. V.-c. 16. Lock's Bottom, 1917; *P.H.C.* V.-c. 17. Oxshott, 1932; *P.H.C.* Wimbledon Common, casual, 1944; Kew Gardens, weed, 1945; *B.W.* Near Leatherhead, 1919; *E.B.B.* Sutton; *P.H.C.* V.-c. 20. Arkley; *P.H.C.* V.-c. 21. Muswell Hill, 1897, *J.E.C.; Hb.Mus.Brit.* conf. *D.P.Y.* The var. PURPUREA Parl. occurs as a garden weed in v.-c. 21. West Ealing, 1932-51; Staines, 1944-51; *D.H.K.*

*O. EUROPAEA Jord. sec. Weigand, O. STRICTA auct. angl. non L. Alien. America, etc. Naturalised on waste ground, and as a persistent garden weed. Not common. V.-c. 16. Hayes Rectory, 1938; *D.McC.* V.-c. 17. Near Littleworth Common, 1912, *A.B.J.; Hb.Mus.Brit.* det. *D.P.Y.* Kew Gardens, weed, 1945; *B.W.* Oxshott, 1948, *E.B.Ba. & J.B.E.*† V.-c. 21. Waste ground near Twickenham Bridge, 1935, *R.M.; Hb.L.* det. *D.P.Y.* Garden weed at Sunbury, Staines, Syon Park, Ealing and Willesden Green, 1944-51; *D.H.K.* Weed in garden of Manor Farm, Ruislip, 1947; *L.N.H.S. Excursion.* Weed in King's Privy Garden, Hampton Court, 1944; *B.W.* Laleham, 1950, *D.H.K.; Hb.K.* Garden weed near Hampstead, 1948; *R.A.B.* The forma PILOSELLA Weigand has been collected in v.-c. 21. Church End, Finchley, 1925-27, *J.E.C.; Hb.Mus.Brit.* det. *D.P.Y.*

**The alien yellow-flowered species of Oxalis have been much confused, and some of the records probably need revision. Dr. D. P. Young has not, so far, encountered a specimen of* O. STRICTA L. sec. Weigand *from the London Area.*

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†Evans, J. B.

O. Martiana Zucc., O. floribunda Lehm. Alien. Brazil. Naturalised as a persistent garden weed. Not common. V.-c. 21. Weed in kitchen garden, Osterley Park, 1900, *A.L.*; *Hb.Druce* det. *D.P.Y.* Flower bed weed, Syon Park, 1946; *D.H.K.* Garden weed, Twickenham, 1950; *D.P.Y.* Garden weed, West Ealing, 1950; *D.H.K.*

BALSAMINACEAE

IMPATIENS L.

I. capensis Meerburgh, I. biflora Walt., I. fulva Nutt. *Orange Balsam.* Alien. N. America. Naturalised on banks of streams and rivers, and in ditches. Locally abundant. V.-c. 16. Millpond near Dartford railway station, 1948; gravel pits, Dartford, 1948-51; *H.M.P.* V.-c. 17. Frequent by the Thames from Weybridge to Kew. Wimbledon Common, abundant and apparently uniformly cleistogamous, 1942; *J.E.L.* By River Mole near Leatherhead, 1921; *E.B.B.* By River Mole near Norbury Park, 1941; *P.H.C.* V.-c. 20. Plentiful by the Chess, Gade, Colne and Grand Union Canal, from near Sarratt to Watford and Springwell. Frequent about gravel pits between Rickmansworth and the Middlesex and Bucks boundaries; *D.H.K.* V.-c. 21. Very abundant by the Colne from Springwell to Staines, and by the Grand Union Canal from Springwell to West Drayton. Frequent by the Thames from Staines to Twickenham. Common by the Cran from Hatton to Twickenham; canal side, West Drayton to Dawley; canal side, Hanwell, scarce; Chiswick; Feltham; Isleworth; Syon Park, 1944-51; *D.H.K.* V.-c. 24. Common by the Colne and its tributaries at Colnbrook and Denham, 1944-51; *D.H.K.*

I. parviflora DC. *Small-flowered Balsam.* Alien. Siberia. Naturalised in woods, by streamsides and roadsides, and on waste ground. Rather common, and increasing. V.-c. 16. Dartford, 1930; Westerham, 1942; *P.H.C.* Newington Dump, Sevenoaks, 1951; *D.McC.* V.-c. 17. Limpsfield, 1917; *R.W.R.* Walton-on-Thames, 1913, *W.B.*; *Hb.B.* By River Mole near Mickleham; Norbury Park Woods, abundant, 1918, *E.B.B.*; *Hb.B.*; 1936; *W.H.S.*; 1942; Titsey Hill, 1930; near Betchworth, 1932, *J.E.L.*; *Hb.L.*; 1951; *K.E.B.* Redhill; Wray Park, 1931; Oxted, 1936; *P.H.C.* Towing path, Kew, 1919; *J.E.C.*; 1945; *B.W.* Wimbledon, 1930; *P.H.C.* Wimbledon Common, 1942; *D.H.K.*; two places, 1945; by Petersham Church, 1942; Kew Gardens, weed in several places, 1945-50; by railway near Putney, 1950; roadside, Cobham, 1948; *B.W.*; 1950; *L.N.H.S. Excursion.* Caterham, 1940; *P.H.C.* By Trumpet Hall, Reigate Heath, 1951; *K.E.B.* V.-c. 18. Woodford, 1909; *C.L.C.* By Ching Brook, Whitehall Plain, 1934; *J.R.*; 1951; *B.T.W.* V.-c. 20. Near Watford, 1925; *J.E.C.* Broxbourne to Rye House, 1930; *P.H.C.* V.-c. 21. Stoke Newington, 1903; Highbury, 1905, *E.M.D.*; *Hb.L.N.H.S.* Crouch End 1897; Hampstead, 1908, *J.E.C.*; *Hb.Mus.Brit.*; still in many places about Hampstead, 1951; *D.H.K.* Uxbridge, 1910; *J.E.C.*; 1950; Yiewsley; near Hounslow Heath; Chiswick; Gunnersbury Park, Acton, weed; Staines, 1944-51; *D.H.K.* Bombed site, Red Lion Square, W.C.1., 1950; *J.W.*

I. GLANDULIFERA Royle, I. ROYLEI Walp. *Indian Balsam.* Alien. Himalaya. Naturalised by rivers, streams and ponds, and on waste ground. Locally abundant, and increasing. V.-c. 16. West Wickham; Lewisham; Catford; Sydenham, 1938; *D.McC.* Abundant by the Ravensbourne from Bellingham to Lewisham, 1950; *F.R.* V.-c. 17. Thames bank near Sunbury, 1928; Thames side between Richmond and Kew, 1932, *J.E.L.*; Hb.L. River Mole by Burford Bridge, 1941; Weybridge; *P.H.C.* Beverley Brook, N. of Barnes Common, 1948; River Mole, W. of Esher, 1949; River Mole at Cobham, 1942; *B.W.*; 1950; *L.N.H.S. Excursion.* V.-c. 18. Walthamstow Reservoirs, 1951; *J.B.* V.-c. 20. Bank of River Beane below Port Hill, Hertford, 1951; *S.C.M.** V.-c. 21. Highgate Ponds, abundant; *R.S.R.F.*; 1951; canal bank, Yiewsley and Dawley; Thames bank from Isleworth to Syon Park, in profusion; River Brent from Stonebridge to Hanwell, abundant; Silkstream, Colindale; East, West and North-west Heaths, Hampstead; Ealing Common; Lea Navigation Canal between Tottenham and Edmonton; Kenton, 1932-5; *D.H.K.* Pymmes Brook, Edmonton, 1950; *R.M.P.* By railway, Westbourne Park, 1951; *K.E.B.*

SIMARUBACEAE

AILANTHUS Desf.

A ALTISSIMA (Mill.) Swingle. *Tree-of-Heaven.* Alien. China. A frequently planted tree in London, which reproduces freely from seed. Spontaneous seedlings are reported from v.-c. 17. Bombed site, Kew Road, Richmond, 1948; *B.W.* V.-c. 18. Bombed site, South Stifford, 1949; *J.E.L. & B.W.* V.-c. 21. Plentiful in the basements of bombed buildings in the Temple, 1944; Holborn, 1945-51; *J.E.L.* Bombed sites, Bloomsbury, Soho, Pimlico and Chelsea, frequent; by the railway between Gloucester Road and South Kensington; West Heath, Hampstead; rubbish-tips, Hanwell and Greenford, 1944-51; *D.H.K.*

AQUIFOLIACEAE

ILEX L.

I. AQUIFOLIUM L. *Holly.* Woods, plantations and hedges. Rather common, though often planted. Recorded in all the v.-cc.

CELASTRACEAE

EUONYMUS L.

E. EUROPAEUS L. *Spindle Tree.* Hedges, thickets and woods. Rather common, especially on calcareous soils. V.-c. 16. Frequent. V.-c. 17. Plentiful. V.-c. 18. Epping Forest, *L.B.H.*; *Hb.H.* Hale End; Warley; *R.W.R.* Magdalen Laven, 1906; *S.A.* Near Theydon Bois, 1926; *L.J.T.* Kelvedon Hatch, 1928; *B.T.W.* Near Abridge, 1939; *P.H.C.* V.-c. 19. Great Parndon, 1913, *P.H.C.*; *Hb.L.N.H.S.* Epping Lower Forest, 1951; *R.M.P.* V.-c. 20. Whippendell Wood, 1907, *C.S.N.*; *Hb.L.N.H.S.* Essendon; Rickmansworth; *P.H.C.* Cassiobury Park;

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*Mortis, Mrs. S. C. (Mrs. R. H. Mortis)

C.S.N. Rye Meads, 1938; *P.H.C.* V.-c. 21. West Heath, Hampstead, 1905; *L.B.H.* Staines, 1905; *P.H.C.*; 1950; *D.H.K.* N.W. of Uxbridge, 1922; *L.J.T.*; 1950; *D.H.K.* Towing path near Laleham, 1905, *C.S.N.*; *Hb.L.N.H.S.*; 1944; *D.H.K.* Ickenham, 1922; Eastcote; Ruislip; Harefield, 1926; *L.J.T.*; 1950; *D.H.K.* South Mimms; Hadley Wood; *P.H.C.* Springwell; Yiewsley; near Hampton Court; Yeoveney, 1944-51; *D.H.K.* V.-c. 24. Iver, 1910; *J.E.C.*; 1951; *D.H.K.* Fulmer; *P.H.C.* Langley Park, 1931; *J.C.B.*

E. JAPONICUS Thunb. Alien. Japan. Garden escape. V.-c. 21. Bombed site by Royal Hotel, W.C.1., a seedling, 1950. *J.W.*; *Hb.Mus.Brit.* det. *A.M.*

RHAMNACEAE

RHAMNUS L.

R. CATHARTICA L. *Common Buckthorn.* Woods and hedges. Locally plentiful on the chalk, rather rare elsewhere. V.-c. 16. Common on the chalk. Paul's Cray Common; *W.W.* Keston, 1917; *P.H.C.* V.-c. 17. Plentiful on the chalk. Thames bank between Kew and Richmond, one or two bushes, 1918; *E.B.B.* Wimbledon Common, 1930; *R.W.R.*; 1944; Ham Common, 1944; *B.W.* V.-c. 18. Epping Forest, 1896, *A.W.B.*; *Hb.L.N.H.S.*; 1922; *L.J.T.* V.-c. 19. Great Parndon, 1913; *P.H.C.* V.-c. 20. Horn's Mill; Essendon; Rickmansworth; *P.H.C.* V.-c. 21. East Finchley, 1888, *J.E.C.*; *Hb.Mus.Brit.* Staines, 1912; *P.H.C.*; 1946; *D.H.K.* Harmondsworth, 1909, *P.H.C.*; *Hb.L.N.H.S.* N. of Uxbridge, 1922; *L.J.T.*; 1944; *D.H.K.* Near Yiewsley; between Hampton and Hampton Court; Poyle; Yeoveney; near Stanwell Moor; Harefield Moor, 1939-51; *D.H.K.* Whitchurch Common, 1948; *B.W.* & *D.H.K.* V.-c. 24. Alderbourne Valley, N.W. of Uxbridge, 1922; *L.J.T.*

FRANGULA Mill.

F. ALNUS Mill., RHAMNUS FRANGULA L. *Alder Buckthorn.* Heaths, commons and woods. Local. V.-c. 16. Chislehurst, Pauls Cray and Hayes Commons; *W.W.* Near Elmstead Wood, 1915; *L.J.T.* By Keston Pond, 1917; *P.H.C.*; 1951; *H.M.P.* Westerham, 1921; *R.W.R.* Abbey Wood, 1927; *H.J.B.* Hosey Common, 1936; *P.H.C.* V.-c. 17. Little Heath; Oxshott Heath, 1915; *E.B.B.* Wimbledon Common, 1925; Epsom Common, 1929, *J.E.L.*; *Hb.L.* Esher Common, 1915; Colley Hill, Reigate, on chalk, 1917; *E.B.B.* Limpsfield Common; Reigate Heath, 1921; Shirley, 1922; *R.W.R.* Worms Heath, 1936; Cobham, 1939; Woldingham; *P.H.C.* Sheen Common, 1943; *B.W.* V.-c. 18. Warley Gap, 1910; Noak Hill, 1912, *P.H.C.*; *Hb.L.N.H.S.* Snaresbrook; *R.W.R.* V.-c. 20. Oxhey Woods; *D.H.K.* V.-c. 21. Highgate Woods, 1905. *C.S.N.*; *Hb.L.N.H.S.*; 1948; *D.H.K.* Winchmore Hill Wood; *L.B.H.* Bishops Wood; Hampstead Heath; *C.S.N.* North-west Heath, Hampstead, 1948; *D.H.K.* East Finchley, 1909-14; *J.E.C.* Ken Wood; *C.H.A.* Harrow Weald Common, 1945; *B.W.* Ruislip, 1948; *D.H.K.* Copse Wood, Northwood; *F.E.W.* V.-c. 24. Alderbourne Farm, Fulmer, 1924; *E.B.B.* Black Park, 1950; *L.N.H.S. Excursion.*

VITACEAE

VITIS L.

V. VINIFERA L. *Grape Vine.* Alien. Europe. Naturalised, from rejected fruit, on rubbish tips, waste ground, and in hedges. Not common. V.-c. 17. Thames bank, Kew Bridge, 1947, known here for many years; *J.E.L.* V.-c. 18. Dagenham Dump, 1934; *J.E.L.* West Thurrock Marshes, several bushes on an old dump, 1949, *J.E.L. & B.W.*; *Hb.L.* V.-c. 21. Hedge, Staines Road, Hounslow Heath, 1944-51; Horsendon Lane, Perivale, climbing trees, 1939-51; *D.H.K.* Rubbish-tip, Northolt, 1947, *J.E.L.*; *Hb.L.*; 1951; *D.H.K.* Bombed site, Bedford Way, W.C.1., 1950, *J.W.*; *Hb.Mus.Brit.*

PARTHENOCISSUS Planch.

P. QUINQUEFOLIA (L.) Planch., VITIS HEDERACEA L. *Virginia Creeper.* Alien. N. America. Garden outcast. Naturalised in hedges and on waste ground. Not common. V.-c. 17. Selsdon Road, Croydon, climbing over Elder bushes, 1939; destroyed, 1948, *D.P.Y.*; *Watsonia, 1,* 247 (1950). V.-c. 21. Waste ground, Yiewsley, 1951; *J.E.L., D.McC. & D.H.K.* Bombed site, Theobalds Road, W.C.1, 1950, *J.W.*; *Hb.Mus.Brit.*

HIPPOCASTANACEAE

AESCULUS L.

A. HIPPOCASTANUM L. *Horse-Chestnut.* Alien. S. Europe, Asia Minor, etc. Planted on heaths and commons, and in parks, plantations and streets. Common throughout the area.

ACERACEAE

ACER L.

A. PSEUDO-PLATANUS L. *Sycamore.* Alien. Europe. A frequently planted tree in parks, recreation grounds, plantations, woods and streets. Self-sown seedlings and saplings are common throughout the area.

A. CAMPESTRE L. *Field Maple.* Hedges, woods and thickets. Common in all the v.-cc.

A. PLATANOIDES L. *Norway Maple.* Alien. N. Europe. Planted in woods and plantations. Not common. Self-sown seedlings have been recorded from v.-c. 16. Hayes Common, 1938; *D.McC.* V.-c. 17. Near Cobham, 1915; *E.B.B.* Leatherhead Downs, many self-sown young trees naturalised in hedges and plantations, *A.E.E.*; *B.E.C. 1938 Rep.*, 38 (1939).

A. MONSPESSULANUM L. *Montpellier Maple.* Alien. Europe. Planted in parks, recreation grounds and woods. Not common. V.-c. 21. Ken Wood; *H.B.W.*

PAPILIONACEAE
(LEGUMINOSAE)
LUPINUS L.

L. ARBOREUS Sims. *Tree Lupin.* Alien. N. America. Naturalised on railway banks, waste ground, etc. Not common. V.-c. 16. Abundant at the Thrift, near Darenth, 1946; *F.R.*

L. ANGUSTIFOLIUS L. Alien. Europe. V.-c. 21. Harefield, 1922, *J.E.C.; Hb.Kew.*

L. POLYPHYLLUS Lindl. Alien. N. America. Garden outcast. V.-c. 21. Waste ground, Hendon, 1945-48; *D.H.K.*

LABURNUM (L.) Med.

L. ANAGYROIDES Medic. *Laburnum.* Alien. S. Europe. Commonly planted in gardens, parks, plantations, etc. Self-sown seedlings are frequent on railway banks, waste ground and tips all over the area.

GENISTA L.

G. ANGLICA L. *Petty Whin.* Heaths and commons. Local. V.-c. 16. Dartford Heath; *W.W.*; very fine, 1947; *F.R.* Chislehurst; Hayes; Keston; *W.W.* Keston Bog, 1926, *J.E.L.*; *Hb.L.* West Wickham, 1918; *L.J.T.* N. of Otford, 1933; *P.H.C.* V.-c. 17. Little Heath, Oxshott, 1915; Banks Common, 1919; Bookham Common, 1920; *E.B.B.*; 1950; *C.P.C.* Mitcham Common, 1916; *J.E.C.*; 1931; *P.H.C.*; 1935; *L.P.* Wimbledon Common; *W.W.* Arbrook Common, 1923; Ham Common, 1931; Ashtead, 1939; *P.H.C.* Epsom Common, 1927; *R.W.R.* Banstead Heath, 1926; *L.J.T.* Warlingham, 1923; Walton Heath, 1927; Coulsdon, 1928, *J.E.L.*; *Hb.L.* Barnes Common, 1943; *B.W.* V.-c. 18. Buckhurst Hill, 1882; *J.E.C.* High Beech, 1895, *E.L.S.*; Epping Forest, 1896, *A.W.B.*; *Hb.L.N.H.S.*; 1906; *J.E.C.* Near Woodford; *L.B.H.* Near Highams Park; *J.O.B.* Cooks Folly Wood; Lambourne; *P.H.C.* Loughton, 1951; *R.M.P.* V.-c. 19. Epping Plain, 1926; *L.J.T.* V.-c. 20. Cole Green, 1920; Bricket Wood; *P.H.C.* Colney Furze Field, 1913; Croxley Common; *C.S.N.* V.-c. 21. Stanmore and Whitchurch Commons; Northwood; near Ruislip; *C.S.N.*; seen in all four localities, 1950; *D.H.K.* Warren Gate; Hadley, 1910; *P.H.C.*; 1946; *D.H.K.* Hampstead Heath; *C.S.N.*; still grows sparingly on the West Heath, 1951; Hounslow Heath, plentiful, 1951; *D.H.K.*

G. TINCTORIA L. *Dyer's Green-weed.* Commons, rough pastures and wood borders, chiefly on heavy soils. Local. V.-c. 16. Darrack Wood, Farnborough; *W.W.* Rochester Way, Bexley; Dartford Heath, 1948-51, planted ?; *H.M.P.* V.-c. 17. Mitcham Common, a patch, 1932; *L.P.* V.-c. 18. Brickfield, Pole Hill, Chingford, 1905, *J.O.B.*; *Hb.L.N.H.S.*; 1935; *J.R.* Near Theydon Mount, 1909, *P.H.C.*; *Hb.L.N.H.S.*; 1938; *P.H.C.* Between Colliers Hatch and Toot Hill, 1906; *C.S.N.* Leppitt's Hill, Coopersale, 1906, *R.W.R.*; 1910, *P.H.C.*; *Hb.L.N.H.S.* Bentley; *P.H.C.* V.-c. 20. Near Broxbourne, one large plant; *C.S.N.* Railway bank near Cuffley, 1949: roadside near Bayford railway station, 1951;

S.C.M. V.-c. 21. Harefield; near Northwood, 1902; *C.S.N.*; 1946; *F.E.W.*; *D.H.K.* Near Pinner Hill; *W.W.* Between Ruislip and Harefield, 1924; *H.J.B.* Near Scratch Wood, Edgwarebury, abundant; Horsendon Hill, abundant; South Mimms, 1933-50; *D.H.K.* Ealing, one plant on rubble, 1945; *F.P.D.B.* The ssp. ELATIOR Koch is recorded as an introduction from v.-c. 16, Roadside, Orpington, 1930, *J.E.L.*; *Hb.L.* See *B.E.C. 1931 Rep.*, 824 (1932).

G. HISPANICA L. Alien. Europe. Garden escape. V.-c. 21. Bombed site, Parker Street, W.C.2, 1950, *J.W.*; *Hb.Mus.Brit.* conf. *A.M.*

ULEX L.

U. EUROPAEUS L. *Furze, Gorse.* Heaths, commons, railway banks and waste ground. Common and widely distributed throughout the area.

U. MINOR Roth. *Dwarf Furze.* Heaths and commons. Locally abundant. V.-c. 16. Chislehurst; Keston; *W.W.* Dartford Heath, 1917; *P.H.C.*; 1948-51; *H.M.P.* Hayes Common, 1918; *L.J.T.*; 1926, *J.E.L.*; *Hb.L.* V.-c. 17. Oxshott Heath, 1915; Limpsfield Common, and Chart, 1917; Bookham Common, 1916; *E.B.B.*; 1950, *E.B.Ba.* & *C.P.C.*; *Lond. Nat.*, *30*, 56 (1951). Weybridge, 1922; *L.J.T.* Wimbledon; *P.H.C.* Shirley, 1922; *R.W.R.* Epsom Common, 1928; *B.T.W.* Wandsworth Common, 1929; *J.C.R.* Mitcham Common, 1929; *Limpsfield* Common, 1942, *J.E.L.*; *Hb.L.* Burgh Heath; *J.B.* V.-c. 18. High Beech, 1899, *E.M.D.*; Chigwell Row, 1909, *P.H.C.*; *Hb.L.N.H.S.* Cooks Folly Wood, *R.W.R.* V.-c. 20. Colney Furze Field, 1913, *C.S.N.*; *Hb.L.N.H.S.* V.-c. 21. Ruislip Common, 1921; *J.E.C.*; 1928; *B.T.W.*; 1951; *D.H.K.* Watts Common, Harefield; Northwood; Hounslow Heath, 1944-51; *D.H.K.* V.-c. 24. Black Park, 1899, *A.W.B.*; *Hb.L.N.H.S.*

SAROTHAMNUS Wimm.

S. SCOPARIUS (L.) Wimm., CYTISUS SCOPARIUS (L.) Link. *Broom.* Heaths, woods, rough pastures and railway banks. Common and well distributed in all the v.-cc. Plants with orange-red keels (var. ANDREANUS (Puissart) Asch. & Gr.) are reported from v.-c. 17. Wimbledon Common, 1945; Barnes Common, 1948; *B.W.* V.-c. 21. West Heath, Hampstead, near Jack Straw's Castle, 1948; *B.W.* Hounslow Heath, 1951; *D.H.K.*

ONONIS L.

O. REPENS L. *Smooth Rest-harrow.* Downs, pastures, grassy places and roadside banks, almost confined to the chalk. Locally plentiful. V.-c. 16. Chislehurst; *W.W.* Dartford Heath; Shoreham, 1933; *P.H.C.* Leaves Green, 1929; *J.C.R.* Near Brasted, 1935; *M.M.W.* V.-c. 17. Frequent on the chalk. Chessington, 1933; Ashtead; *P.H.C.* Ham gravel pits, 1943; riverside near Molesey Lock, 1944; riverside above Hammersmith Bridge, 1945; *B.W.* V.-c. 20. Rye House, 1910, *P.H.C.*;

Hb.L.N.H.S. Hatfield; *P.H.C.* Radlett, 1941; *J.B.* V.-c. 21. Towpath, Hampton Court, 1905; *C.S.N.*; 1944; Osterley, casual, 1933; Springwell, plentiful; between Hampton and Sunbury; Horsendon Hill, scarce; railway banks between Colnbrook and West Drayton, abundant, 1939-51; *D.H.K.*

O. SPINOSA L. *Spiny Rest-harrow.* Heaths, commons and rough pastures on heavy soils. Locally abundant. V.-c. 16. Dartford Heath; *E.B.B.* V.-c. 17. Beddington Corner, 1917; Chessington, 1933; Wimbledon; Coombe; Ashtead; *P.H.C.* Littleworth Common, 1918; *L.J.T.* Near Reigate, 1921; *R.W.R.* Mitcham Common, 1922, 1927 and 1941, *J.E.L.*; *Hb.L.* West End Common, Esher, 1949; *B.W.* V.-c. 18. Highams Park; *E.M.D.* Whitehall Plain; Little Warley; *C.S.N.* Near Wake Arms, 1912, *P.H.C.*; *Hb.L.N.H.S.* Chigwell; *P.H.C.* V.-c. 20. Near Arkley, 1908, *C.S.N.*; *Hb.L.N.H.S.*; 1912; *P.H.C.*; 1946; *D.H.K.* Totteridge; *C.S.N.* Near Goffs Oak, 1926; *L.J.T.* V.-c. 21. Whitewebbs, Enfield, 1896; *A.W.B.* Yiewsley, 1913-16; Mill Hill, 1918; *J.E.C.* Finchley Common, 1901; Hadley Common; *C.S.N.*; still plentiful in both places, 1951; *D.H.K.* Staines; *P.H.C.*; Shortwood Common and Staines Moor, abundant; towpath between Kingston Bridge and Hampton Court; Knowle Green; Uxbridge Moor; Barnet Gate; Hanwell, casual; *D.H.K.* Haste Hill, Northwood; *F.E.W. & D.H.K.* Ruislip Common; *B.W.*; *D.H.K.* Plants with white flowers are not uncommon.

TRIGONELLA L.

T. ORNITHOPODIOIDES (L.) DC. *Bird's-foot Fenugreek.* Gravelly and sandy commons and roadsides. Very rare. V.-c. 16. Near Dartford, 1872, *F.J.H.*; *Hb.Mus.Brit.* Keston Common; sandy roadside, Lane End, near Darenth, 1945; *F.R.*; 1951; *F.R.*, *R.A.G.*, *R.C.L.B. & D.H.K.* V.-c. 17. Mitcham Common, 1927 and 1933; Reigate Heath, 1931, *J.E.L.*; *Hb.L.*; 1950; *B.M.C.M.*

T. FOENUM-GRAECUM L. Alien. E. Europe. V.-c. 21. Yiewsley, 1908 and 1913; Hackney Marshes, 1915, *J.E.C.*; *Hb.Mus.Brit.*

T. PROCUMBENS Reichb. Alien. E. Europe. V.-c. 16. Abbey Wood, *St.J.M.*; *B.E.C. 1925 Rep.*, 870 (1926). By Thames towpath, Erith; *R.A.B.* V.-c. 21. Hackney Marshes, 1912-13, *J.E.C.*; *Hb.Mus.Brit.*

T. HAMOSA L. Alien. Mediterranean Region. V.-c. 16. Beckenham Park Place, 1934, *E.J.B.*; *Hb.L.* V.-c. 18. Dagenham, *J.P.M.B.*, *N.Y.S. & H.K.A.S.*; *B.E.C. 1936 Rep.*, 246 (1937).

MEDICAGO L.

M. FALCATA L. *Yellow Sickle Medick.* Alien. Europe, including parts of Britain. Naturalised in grassy waste places and by roadsides, and on stream and river banks. Rare, and sometimes only casual. V.-c. 16. Plumstead Marshes, 1915; Crayford, 1916; *J.E.C.* V.-c. 17. Reigate Heath, 1933, *J.E.L.*; *Hb.L.*; 1950; *B.M.C.M.* Epsom Downs, one good patch, 1934; *R.W.R.*; 1942, *A.E.E.*; *Hb.E.C.M.* Putney Heath, casual, 1935; *C.A.* Wimbledon Common, 1942; *C.A.*; 1951; *R.A.B.*

Towing path, Richmond, 1942; *P.H.C.* Roadside near Chiswick Bridge, 1942; riverside between Barns Railway Bridge and Hammersmith, 1945; *B.W.* By River Wandle near Mitcham, 1943, *P.H.C.*; *Hb.L.N.H.S.* Barnes Common, 1947; *M.W.*; 1951; *L.N.H.S. Excursion.* V.-c. 18. Dagenham Dock, 1927, *J.E.C.*; *Hb.L.* V.-c. 21. Muswell Hill, 1904; Hackney Marshes, 1912; North Finchley, 1915; *J.E.C.* Uxbridge Common, 1903, *A.L.*; *Hb.Druce*; 1912, *P.H.C.*; *Hb.L.N.H.S.* Ealing, casual, 1938; *D.H.K.* Bombed site between Milton and Whitecross Streets, E.C.; *F.E.W.*; 1949, *J.E.L.*; *Hb.L.* Near West Drayton, 1950; *H.B. & R.A.B.* The var. TENUIFOLIATA Vuyck. is recorded from v.-c. 16. Dartford Heath; *H.M.P.* teste *F.R.* V.-c. 17. Towing path, Key, 1932, *J.Fr.*; *Hb.L.* Barnes Common, 1947; *M.W.* det. *A.J.W.*; 1951; *L.N.H.S Excursion.*

×SATIVA = M. VARIA Martyn, M. SYLVESTRIS Fries. Alien. Europe, including parts of Britain. Naturalised in waste places. Very rare. V.-c. 18. Dagenham Dock, 1927, *J.E.C.*; Grays, 1949, *J.E.L.*; *Hb.L.*

M. SATIVA L. *Lucerne.* Alien. Asia, N. Africa, etc. Extensively cultivated as a fodder crop and occurring commonly on railway banks, road verges, field borders, rubbish tips, etc., as an escape. Recorded from all the v.-cc.

M. HISPIDA Gaertn. Alien. S. Europe. V.-c. 16. Beckenham Park Place, 1934, *E.J.B.*; Hextable, introduced with "shoddy", 1948, *D.McC.*; 1949, plentiful, *J.E.L.*; *Hb.L.*; 1950, *D.McC.*; *Lond. Nat.*, *30*, 4. (1951)

var. DENTICULATA (Willd.) Burnat. Alien. Europe. V.-c. 16. Dartford, *F.J.H.*; *Fl. Kent*, 87. V.-c. 17. Mortlake, 1917; *J.E.C.* V.-c. 21. Yiewsley, 1908-9; Hackney Marshes, 1912-15 and 1920; *J.E.C.* Hendon, 1912, *P.H.C.*; *Hb.L.N.H.S.* Forecourt of Soya Foods Ltd., Springwell, 1946; *D.H.K.* Gravel pit, East Bedfont, abundant, 1946; *J.P.M.B. & D.H.K.* V.-c. 24. Uxbridge, 1911; near Iver, 1920; *J.E.C.*

var. APICULATA (Willd.) Burnat. V.-c. 17. Mortlake, 1917; *J.E.C.* V.-c. 21. Yiewsley, 1909; Hackney Marshes, 1910 and 1912, *J.E.C.*; *Hb.Mus.Brit.*; 1918 and 1924; *J.E.C.* V.-c. 24. Near Iver, 1915; *J.E.C.*

var. LAPPACEA (Desr.) Burnat. V.-c. 21. Hackney Marshes, 1912, *J.E.C.*; *Hb.Mus.Brit.*

M. ARABICA (L.) All. *Spotted Medick.* Roadsides, grassy places and banks, preferring gravelly or sandy soils. Locally abundant. V.-c. 16. Frequent in the sandy and gravelly areas. V.-c. 17. Common by the Thames between Ham and Richmond. Between East Croydon and Shirley, 1926, *J.E.L.*; *Hb.L.* Bletchingly; near Broadham Green, 1931; *J.C.R.* Banstead, 1943; *P.H.C.* V.-c. 18. Bulpham, 1909, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. Haileybury, 1909; *P.H.C.* Near Hertford; *S.C.M.* V.-c. 21. Frequent by the Thames from Staines to Hampton Court. Yiewsley, 1917; *J.E.C.* Palmers Green, 1905; *P.H.C.* East Bedfont, near Hounslow Heath, 1946; *D.H.K.* Canal path, Brentford, casual, 1949; *H.C.H. & D.H.K.* V.-c. 24. Lambourne Farm, Iver, one plant, 1931; *J.C.R.*

M. MINIMA (L.) L. Alien. Europe, including parts of Britain. V.-c. 16. Hextable, introduced with "shoddy", 1948, *D.McC.*; 1949, *J.E.L.*; *Hb.L.*; 1950, *D.McC.*; *Lond. Nat.*, *30*, 4 (1951). The var. RECTA (Desf.) Burnat also occurred.

M. LUPULINA L. *Black Medick, Nonsuch.* Roadsides, fields and grassy waste places. Common throughout the area. The var. SCABRA S. F. Gray is reported from v.-c. 21. Harefield chalkpit, 1923; *E.B.B.*, and the var. WILLDENOWIANA Koch has been found in v.-c. 16. Holwood, 1921; *E.B.B.* Force Green, 1932; *B.T.W.* V.-c. 17. Cheam, 1926, *E.C.W.*; Tamworth Lane, Mitcham 1930; *J.E.L.*; *Hb.L.* V.-c. 21. Harefield chalkpit, 1923; *E.B.B.* Uxbridge; Chiswick; *D.H.K.* Springwell; Hanwell, 1947; *N.Y.S. & D.H.K.* Monstrous forms (var. UNGUICULATA Reichb.) are reported from v.-c. 17. Waste land by Hampton Court railway station, 1945; *B.W.* V.-c. 21. West Drayton, 1920; *L.B.H.* Chiswick, 1944; *D.H.K.*; Springwell, 1947, *B.W.*; *Hb.K.*

M. PRAECOX DC. Alien. S. Europe. V.-c. 16. Hextable, introduced with "shoddy", 1950, *D.McC.*: *Lond. Nat.*, *30*, 4 (1951); 1951; *D.McC.*

M. LACINIATA (L.) Mill. Alien. S. Europe. V.-c. 16. Hextable, introduced with "shoddy", 1948, *D.McC.*; 1949, *J.E.L.*; *Hb.L.* V.-c. 21. Alperton, 1917; *J.E.C.*

M. RETICULATA Benth. Alien. Europe. V.-c. 17. Mortlake, 1923, *J.E.C.*; *Hb.Kew.* V.-c. 24. Near Iver, 1915, *J.E.C.*: *Hb.Kew.*

MELILOTUS Mill.

M. ALTISSIMA Thuill., M. OFFICINALIS Lam. em. Hayne. *Common Melilot.* Railway banks, waste places and roadsides. Rather common. V.-c. 16. Near Northfleet; near Southfleet, 1919; Dartford, 1930; Shoreham, 1933; *P.H.C.* Railway bank, Orpington, 1946; *F.R.* Railway side, Stone Marshes, one plant, 1950; *H.M.P.* Sevenoaks Brickworks, 1951; *D.McC.* V.-c. 17. Colley Hill, Reigate, 1917; near Betchworth railway station, 1923; *E.B.B.* Limpsfield; *R.W.R.* Ham gravel pits, 1932; Weybridge; Ashtead; Mickleham; Banstead; *P.H.C.* Betchworth lime pits, 1941; *J.E.L.* River wall, Barnes, 1945; river wall, Kew, 1946; *B.W.* V.-c. 18. Chigwell; *S.A.* Near Albert Dock, 1934; Purfleet, 1935; *P.H.C.* Roadside, Ilford; *B.T.W.* V.-c 19. Latton Park, scarce, 1951; *B.T.W.* V.-c. 20. Bricket Wood, 1938; *R.W.R.* Springwell, 1950; *D.H.K.* V.-c 21. Harefield, 1909, *C.S.N.*; *Hb.L.N.H.S.*; 1950; *D.H.K.* Golders Green, 1909, *P.H.C.*; *Hb.L.N.H.S.* Whitchurch, 1910; *P.H.C.* East Finchley; Finchley; Muswell Hill; Yiewsley; *J.E.C.* Uxbridge, Ruislip; Greenford, 1944-49; *D.H.K.* V.-c. 24. Langley; *L.B.H.* Denham, 1935; *P.H.C.* The plant has been much confused with M. OFFICINALIS (L.) Lam. em. Thuill. and some of the records may need revision.

M. ALBA Desr. *White Melilot.* Alien. Europe. Naturalised on railway banks, rubbish-tips, waste places and by roadsides. Common and widely distributed though unrecorded for v.-c. 19.

M. OFFICINALIS (L.) Lam. em. Thuill., M. ARVENSIS Wallr. *Field Melilot.* Alien. Europe. Naturalised on railway banks, waste ground, rubbish-tips and by roadsides. Common and widely distributed.

M. INDICA (L.) All., M. PARVIFLORA Desf. *Small-flowered Melilot.* Alien. Europe. Naturalised on waste ground, rubbish-tips and roadsides. Rather rare, and often only casual. V.-c. 16. Green Street Green, 1936, *P.H.C.*; *Hb.L.N.H.S.* Lessness Abbey, 1948; *R.A.B.* By Kemsing railway station, 1948; *D.McC.* V.-c. 17. Tamworth Lane, Mitcham, 1930; Epsom Downs, 1932, *J.E.L.*; *Hb.L.* Epsom College Farm, 1937, *A.E.E.*; *B.E.C. 1939-40 Rep.*, 274 (1942). Wimbledon Common, 1943; riverside by Teddington Lock, 1946; *B.W.* West End Common, Esher, 1948; *R.A.B.* V.-c. 18. West Thurrock, 1908, *P.H.C.*; *Hb.L.N.H.S.* Rainham, 1912; *C.S.N.* Dagenham Dock, 1927; *J.E.C.* V.-c. 20. Croxley Mills, 1907, *C.S.N.*; *Hb.L.N.H.S.*; Hoddesdon, 1909; Totteridge; Rye House; *P.H.C.* V.-c. 21. Crouch End, 1898; Muswell Hill, 1902; Yiewsley, 1909-10, *J.E.C.*; *Hb.Mus.Brit.* Hackney Marshes, 1909-14; Northwood, 1911; Hendon, 1915; *J.E.C.* Uxbridge, 1906; *P.H.C.* West Drayton, 1909, *P.H.C.*; *Hb.L.N.H.S.*; 1919, *L.B.H.*; Mill Hill, Warren Gate, *P.H.C.*; between Hanwell and Brentford, 1944; *B.W. & D.H.K.* Railway bank, South Greenford, 1946; rubbish-tip, Hanwell, 1947, *D.H.K.*; *Hb.K.* V.-c. 24. Near Iver, 1916; *J.E.C.* Near Denham, 1919, *L.B.H.*; *Hb.H.*

TRIFOLIUM L.

T. MEDIUM Huds. *Zig-Zag Clover.* Commons, pastures, and banks, preferring heavy soils. Local. V.-c. 16. Chislehurst Common; Camden Park; Keston Bog; *W.W.* Stone Marshes, 1931; *P.H.C.* Swanscombe Wood, 1946; *F.R.*; *L.N.H.S. Excursion.* V.-c. 17. Buckland Hills, 1917; *E.B.B.* Woodcote Park, Epsom, 1927; *E.C.W.*; near Watermeads, Mitcham, 1927; Mitcham Common, 1929; *J.E.L.*; *Hb.L.*; 1941; *P.H.C.* Wandsworth Common, 1929; *J.C.R.* S. of Oxted, 1924; railway bank, Croydon, 1927; *R.W.R.* Walton, 1930; Chaldon, 1935; Reigate, 1941; *P.H.C.* Ham and Wimbledon Commons, 1944; Headley Lane, towards Tot Hill, 1942; *B.W.* V.-c. 18. Lane near Epping, 1927; *R.W.R.* Hainault; *P.H.C.* V.-c. 20. Bricket Wood, 1910; near Essendon, 1920; *P.H.C.* Railway bank, Bushey, 1915; *V.H.C.* V.-c. 21. Near Ruislip, 1871, *F.J.H.*; *Hb.Mus.Brit.* Muswell Hill; *J.E.C.* Near Finchley railway station, 1890; *C.S.N.* Northwood, 1912, *P.H.C.*; *Hb.L.N.H.S.* Hampstead Heath, 1903; *L.B.H.* Finchley Common, 1901; *C.S.N.*; 1944-51; *D.H.K.* South Mimms, 1905; *P.H.C.*; 1949; *D.H.K.* By New River, Enfield, 1906; *E.M.D.* Stanmore Common; Northolt; near Scratch Wood, plentiful; near Hampton Court; Edgware; Horsendon Hill, common, 1944-51; *D.H.K.* Highgate Ponds; *H.C.H.*; 1949; *D.H.K.* Bombed site, Red Lion Square, W.C.1, 1950, *J.W.*; *Hb.Mus.Brit.*

T. PRATENSE L. *Red Clover.* Grassy places and roadsides throughout the area. The form usually encountered appears to be the var.

SATIVUM Schreb. a relic of cultivation, the small wild form is however reported from v.-c. 17. Park Down, Chipstead, 1929; *R.W.R.* The var. PARVIFLORUM Bab. is reported from v.-c. 21. Staines, *C.B.G.* teste *G.C.D.*; *J. Bot.*, *48*, 270 (1910). Roadside, Edgware, 1909, *C.B.G.*; *Hb.S.L.B.I.* Gravel pit E. of Yiewsley, 1920, *J.E.C.*; *Hb.Mus.Brit.* Harefield, 1910; *J.E.C.*, and the var. AMERICANUM Harz. was found in v.-c. 17. Church Lane, Mitcham, 1931, *J.E.L.*; *Hb.L.* White-flowered plants have been reported from v.-c. 17. Chessington, 1946, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Harmondsworth, 1906; East Finchley, 1908, *J.E.C.*; *Hb.Mus.Brit.* The species is very prone to produce monstrous forms and the following have been noted:—with foliaceous calyces, v.-c. 21. East Finchley, 1908; Harefield, 1910; *J.E.C.* With pedunculate flower heads, v.-c. 21. Finchley, 1907, *J.E.C.*; *Hb.Mus.Brit.* With twin flowered heads, v.-c. 21. Railway bank, East Finchley, 1908, *J.E.C.*; *Hb.Mus.Brit.*

T. OCHROLEUCON Huds. *Sulphur Clover.* Dry grassy places and roadsides. Very local. V.-c. 18. Stapleford Tawney, 1913, *P.H.C.*; *Hb.L.N.H.S.* Kelvedon Hatch; *P.H.C.*

T. INCARNATUM L. *Crimson Clover.* Alien. Europe. An escape from cultivation as a fodder crop. V.-c. 16. Hayes, 1935; *D.McC.* V.-c. 17. Near Croham Hurst, 1924, *J.E.L.*; *Hb.L.* V.-c. 21. Finchley, 1914; *J.E.C.* Golders Green, 1921; *P.W.R.* Ashford County Hospital grounds, 1940-41; *J.K.H.* Canal Bank between Denham and Springwell, in several places, 1944; canal bank between Hanwell and Southall, 1945, *D.H.K.*; *Hb.K.* V.-c. 24. Iver Heath, 1912, *P.H.C.*; *Hb.L.N.H.S.* The var. STRAMINEUM Presl is reported from v.-c. 17. Merstham, 1903; *J.E.C.*

T. ARVENSE L. *Hare's-foot Clover.* Grassy places and roadsides on light soils. Locally plentiful. V.-c. 16. Dartford Heath, 1919; *E.B.B.*; 1933; *P.H.C.*; 1946; *F.R.* Hayes Common, 1924, *J.E.L.*; *Hb.L.* Keston, 1936; *P.H.C.*; 1948; *E.B.Ba.* Hayes; West Wickham, 1938; *D.McC.* V.-c. 17. Near Little Heath, 1915; Weybridge Heath, 1917; *E.B.B.* Oxted sand-pit, local, 1917; *R.W.R.* Near Teddington Lock, 1930, *J.E.L.*; *Hb.L.* Ham gravel pits, 1940-50; *B.W.* Ashtead; Reigate, 1941; *P.H.C.*; 1950; *B.M.C.M.* Wimbledon Common, 1936; *C.A.* Sudbrook Park Golf Club, 1946; *C.L.C.* V.-c. 18. Stifford, 1913, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. Hoddesdon gravel pit, 1906; Mill Green, near Essendon, 1920; *P.H.C.* Great Amwell, 1909, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Finchley, 1908; East Finchley, 1909; Hackney Marshes, 1916; Yiewsley, 1920, *J.E.C.*; *Hb.Mus.Brit.* Warren Gate, 1908; East Bedfont; *P.H.C.*; 1946-50; Yeoveney; Hanwell; Chiswick, 1939-51; *D.H.K.* Grounds of Ashford County Hospital; *J.K.H.* V.-c. 24. Iver, 1909; *P.H.C.*

T. SQUAMOSUM L., T. MARITIMUM Huds. *Sea Clover.* Salt marshes and banks of tidal estuaries. Very local. V.-c. 16. Greenhithe to Northfleet; *W.W.*; *P.H.C.* Stone Marshes, 1945; *J.E.L.*

T. SCABRUM L. *Rough Trefoil.* Dry gravelly and sandy places. Very rare. V.-c. 16. Chislehurst Common; *W.W.* V.-c. 17. Riddlesdown, local, 1922; *R.W.R.* V.-c. 18. Roadside near Purfleet, 1935; *P.H.C.*

T. STRIATUM L. *Knotted Trefoil.* Heaths, commons, grassy places and roadsides, with a preference for light soils. Locally plentiful. V.-c. 16. Chislehurst and Hayes Commons; *W.W.* Hayes, 1923, *J.E.L.*; *Hb.L.*; still in both localities, 1944; *F.R.* Green Street Green, near Darenth; *W.W.*; *F.R.* V.-c. 17. Limpsfield Common, very local, 1923; Moorhouse, plentiful, 1924; *R.W.R.* Mitcham Common, 1927, *E.C.W.*; Worms Heath, 1927; Reigate Heath, 1931, *J.E.L.*; *Hb.L.* Wimbledon Common; riverside, Ham, 1940, *P.H.C.*; *Hb.L.N.H.S.*; 1945; *B.W.* V.-c. 20. Colney Heath, 1914; *E.B.B.* Broxbourne; *P.H.C.* Near Wormley, 1906, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. North Finchley, 1926-27; *J.E.C.* South Mimms, *C.B.G.*; *Hb.S.L.B.I.* Hampton Court Home Park, 1913, also towpath nearby, 1928; *L.J.T.*; still plentiful in both places, 1951; Uxbridge Common; Hounslow Heath; near Bedfont, 1944-51; *D.H.K.* V.-c. 24. Langley, 1905; *L.B.H.* The var. ERECTUM Gaspar. is reported from v.-c. 16. Hayes Common, 1945; *J.E.L. & F.R.* V.-c. 21. Mimms Hall, 1910, *C.B.G.*; *Hb.S.L.B.I.*

T. SUBTERRANEUM L. *Subterranean Clover.* Dry banks, fields and commons on sandy and gravelly soils. Locally abundant. V.-c. 16. Dartford Heath, 1878, *F.J.H.*; *Hb.Mus.Brit.* Chislehurst; Dartford; Green Street Green; *W.W.*; seen in the latter two places; *F.R.* Near Abbey Wood, *F.J.H.*; *Fl. Kent*, 89; 1948; *R.A.B.* Stone; *H.M.P.* V.-c. 17. Weybridge, 1900, *L.B.H.*; *Hb.H.*; 1919, *E.B.B.*; *Hb.B.* Mitcham Common, 1923, *D.G.C.*; *Hb.L.*; often seen there since; *J.E.L.* Putney Heath, 1939; *C.A.* Sandy field near Ham gravel pits, 1944; turf in Kew Gardens, 1945; *B.W.* V.-c. 21. Hampton Court Home Park, 1913; *L.J.T.*; 1928, *J.E.L.*; *Hb.L.*; plentiful, 1939-51; *D.H.K.* Mimms Hall, *C.B.G.*; *Hb.S.L.B.I.* Uxbridge Common and Moor; near Walton Bridge, 1939-49; *D.H.K.*

T. FRAGIFERUM L. *Strawberry Clover.* Streamsides, roadsides, commons and damp meadows. Local. V.-c. 16. Greenhithe; *W.W.* Stone Marshes; *J.E.L. & F.R.* V.-c. 17. Mitcham Common, 1922, *J.E.L.*; *Hb.L.* Near Betchworth railway station, 1923, *E.B.B.*; *Hb.B.* Epsom; *P.H.C.* Ashtead, 1939, *P.H.C.*; *Hb.L.N.H.S.* Chertsey Meads, 1924; *W.B.* Near Oxted, local; *R.W.R.* Below Buckland Hills, 1930, *E.C.W.*; *Hb.L.* Riverside meadow, Ham, 1943; Petersham Meadow, near Richmond, 1945; *B.W.* Bookham Common; *C.P.C.*; 1950, *D.H.K.*; *Hb.K.* V.-c. 18. Epping, 1896, *E.L.S.*; Noak Hill, 1913, *P.H.C.*; *Hb.L.N.H.S.* Upminster Common, 1908; *P.H.C.* V.-c. 19. Cobbin's End, 1910, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. Near Totteridge railway station; *C.S.N.* Colney, 1913; *P.H.C.* V.-c. 21. Colney Hatch Lane, 1886, *J.E.C.*; *Hb.Mus.Brit.* Lea Marshes, near Tottenham, 1899, *R.W.R.*; Kingsbury, 1910, *P.H.C.*; *Hb.L.N.H.S.* Thames at Chertsey

Bridge; Yiewsley; *C.S.N.*; seen in both places, 1944-46; *D.H.K.* Staines; Shepperton; between Hampton and Hampton Court; Harefield, 1943-49; *D.H.K.*

T. HYBRIDUM L. *Alsike Clover.* Alien. Europe. Cultivated as a fodder crop and naturalised in fields and on waste ground, railway banks, rubbish-tips and by roadsides. Common and well distributed, though unrecorded from v.-c. 19. Proliferous forms are reported from v.-c. 17. Sanderstead, 1927; Church Walk, Mitcham, 1931, *J.E.L.*; *Hb.L.* V.-c. 21. Harefield; Yiewsley; Finchley, 1910; *J.E.C.* V.-c. 24. Iver, 1927; *J.E.C.*

T. ELEGANS Savi. Alien. Mediterranean Region. Cultivated as a fodder crop and naturalised in fields and on waste ground, railway banks, rubbish-tips and by roadsides. Possibly common, though much confused with the previous species (see *J.E.L.*; *Watsonia*, *1*, 119 (1949)). V.-c. 16. Green Street Green, Farnborough, 1947, *J.E.L. & J.E.W.*; *Hb.L.* V.-c. 18. Waste ground, Epping, 1951; *D.H.K.* V.-c. 21. Gravel pit, East Bedfont; near Staines, 1951; *J.E.L. & D.H.K.* Clapton, 1909, *P.H.C.*; *Hb.L.N.H.S.* det. *D.H.K.*

T. REPENS L. *White, or Dutch Clover.* Pastures, meadows, waste ground, banks and waysides. Very common and well distributed throughout the area. Plants with foliaceous calyces are reported from v.-c. 21. East Finchley; Hornsey; West Drayton; Uxbridge; *J.E.C.* Gravel pit, East Bedfont, 1946; *A.W.W.*

T. GLOMERATUM L. *Clustered Clover.* Commons, and sandy and gravelly banks. Very rare. V.-c. 16. Chislehurst, casual; Green Street Green, Darenth; *W.W.*; 1945; *F.R.* Keston Common; *C.T.* teste *F.R.*; 1946; *F.R.*; 1948; *E.B.Ba.*

T. SUFFOCATUM L. *Suffocated Clover.* Dry banks and roadsides on sandy and gravelly soils. Very rare. V.-c. 16. Roadside, Lane End, near Darenth, 1945, *F.R.*; *Hb.L.*; 1951; *F.R.*, *R.A.G.*, *R.C.L.B.* & *D.H.K.*

T. AUREUM Poll., T. AGRARIUM auct. Alien. Europe. V.-c. 16. Green Street Green, near Farnborough, 1937, *J.E.L. & H.W.M.*; *Hb.L.* V.-c. 17. Epsom College and Mizen's Market Garden, Ewell, 1942, *A.E.E.*: *Hb.E.C.M.* V.-c. 21. Waste ground, Finchley, 1929, *J.E.C.*; *Hb.Mus.Brit.*

T. CAMPESTRE Schreb., T. PROCUMBENS auct. *Hop Trefoil.* Fields, roadsides, banks and waste ground. Common and widely distributed in all the v.-cc. except 19, where it is so far unrecorded.

T. DUBIUM Sibth. *Lesser Clover.* Fields, waste places, banks and roadsides. Very common throughout the area.

T. MICRANTHUM Viv., T. FILIFORME auct. *Slender Trefoil.* Heaths, commons, pastures and roadsides, with a preference for sandy soils.

Locally abundant. V.-c. 16. Chislehurst; Pauls Cray, Keston and Hayes Commons; *W.W.* Hayes, 1923, *J.E.L.*; *Hb.L.* Dartford Heath; Abbey Wood, 1936; *P.H.C.* V.-c. 17. Wandsworth Common, 1871, *F.J.H.*; *Hb.Mus.Brit.* Epsom; *L.B.H.* Limpsfield, 1917; Worms Heath, 1931; *R.W.R.* Walton; Ashtead, 1930; Limpsfield Chart, 1933; Gatton, 1935; Dulwich Park, 1936; *P.H.C.* Ham Common, 1942; sandy field near Ham House; riverside, Molesey, 1945; Wimbledon Common, 1946; Richmond Park, 1950; *B.W.* V.-c. 21. South Mimms, 1916; *J.E.C.* Hendon, *P.H.C.* Hampton Court Home Park, 1913; *L.J.T.*; abundant, 1939-51; near Potters Bar; Uxbridge Common; near Staines; Walton Bridge; Penton Hook; Laleham; Bushy Park; Hounslow Heath, 1944-51; *D.H.K.* Garden lawn, Hampton Hill, 1949; *P.F.Y.* Syon Park, 1946; *B.W. & D.H.K.* V.-c. 24. Denham; *P.H.C.*; 1950; *D.H.K.*

T. LAPPACEUM L. Alien. Mediterranean Region. V.-c. 21. East Finchley, 1907; Yiewsley, 1908; Finchley, 1910; *J.E.C.*

T. ANGUSTIFOLIUM L. Alien. Mediterranean Region. V.-c. 17. Gravelly roadside, Banstead, 1932, *E.C.W.*; *Hb.L.*

T. RESUPINATUM L. *Reversed Clover.* Alien. S. Europe. V.-c. 17. Selsdon, 1946, *M.M.W.*; *Hb.L.* V.-c. 20. Towing path near Broxbourne, 1902, *C.S.N.*; *Hb.L.N.H.S.*; 1907; *P.H.C.* V.-c. 21. Muswell Hill, 1902; Yiewsley, 1919-21, *J.E.C.*; *Hb.Mus.Brit.*

T. PARVIFLORUM Ehrh. Alien. Mediterranean Region. V.-c. 21. Hackney Marshes, 1913; *J.E.C.*

T. ALBIDUM Retz. Alien. S. Europe. V.-c. 21. Finchley; Muswell Hill, 1907; *J.E.C.*

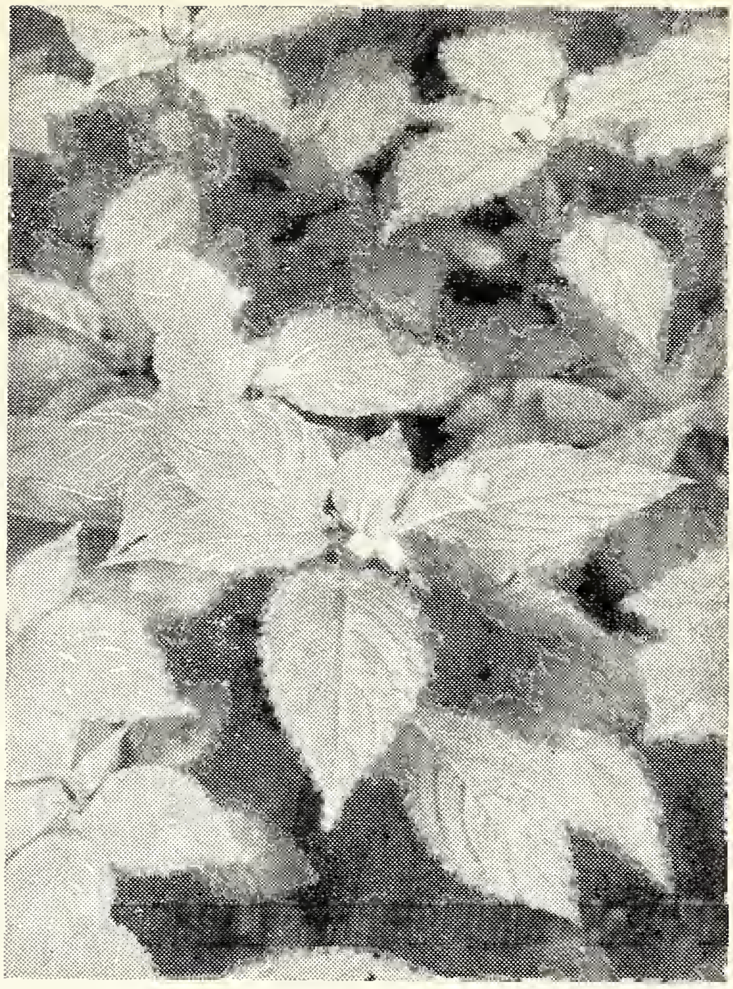
ANTHYLLIS L.

A. VULNERARIA L. *Kidney Vetch, Lady's-fingers.* Downs, banks and field borders. Rather common on the chalk, uncommon on other soils. V.-c. 16. Chalkpit between Leaves Green and West Wickham, 1917; Hosey Common; *P.H.C.* Near Otford, 1922; near Knockholt, 1925; *L.J.T.* Greenhithe; Cobham Terrace, Stone; by Darenth Wood, 1950; *H.M.P.* Shoreham, 1951; *E.B.Ba.* V.-c. 17. Farthing Downs, 1904; *P.H.C.* Near Betchwood, *L.B.H.*; *Hb.H.* Foot of Colley Hill, Reigate, 1917; edge of Banstead Wood, 1924; *E.B.B.* Near Merstham, 1918; Reigate Hill, 1919; *L.J.T.* Downs above Oxted, 1917; *R.W.R.* Epsom Downs, 1930, *P.H.C.*; *Hb.L.N.H.S.* Warlingham, 1923, *J.E.L.*; *Hb.L.* Banstead Downs, 1947; *B.W.* V.-c. 18. Hainault, 1913; *P.H.C.* V.-c. 21. Absent from the Middlesex chalk; *D.H.K.* Roadside near Staines Moor, 1910-13; *J.E.C.* Near Uxbridge, 1913; *P.H.C.*; plentiful on railway banks, 1947-51; grassy waste land, Hanwell, 1942; railway bank near Greenford, one large patch, 1951, *D.H.K.*; *Hb.K.* V.-c. 24. Langley, 1905; *L.B.H.* Cornfield, Thorney, 1905; *P.H.C.*

BONJEANIA Rchb.

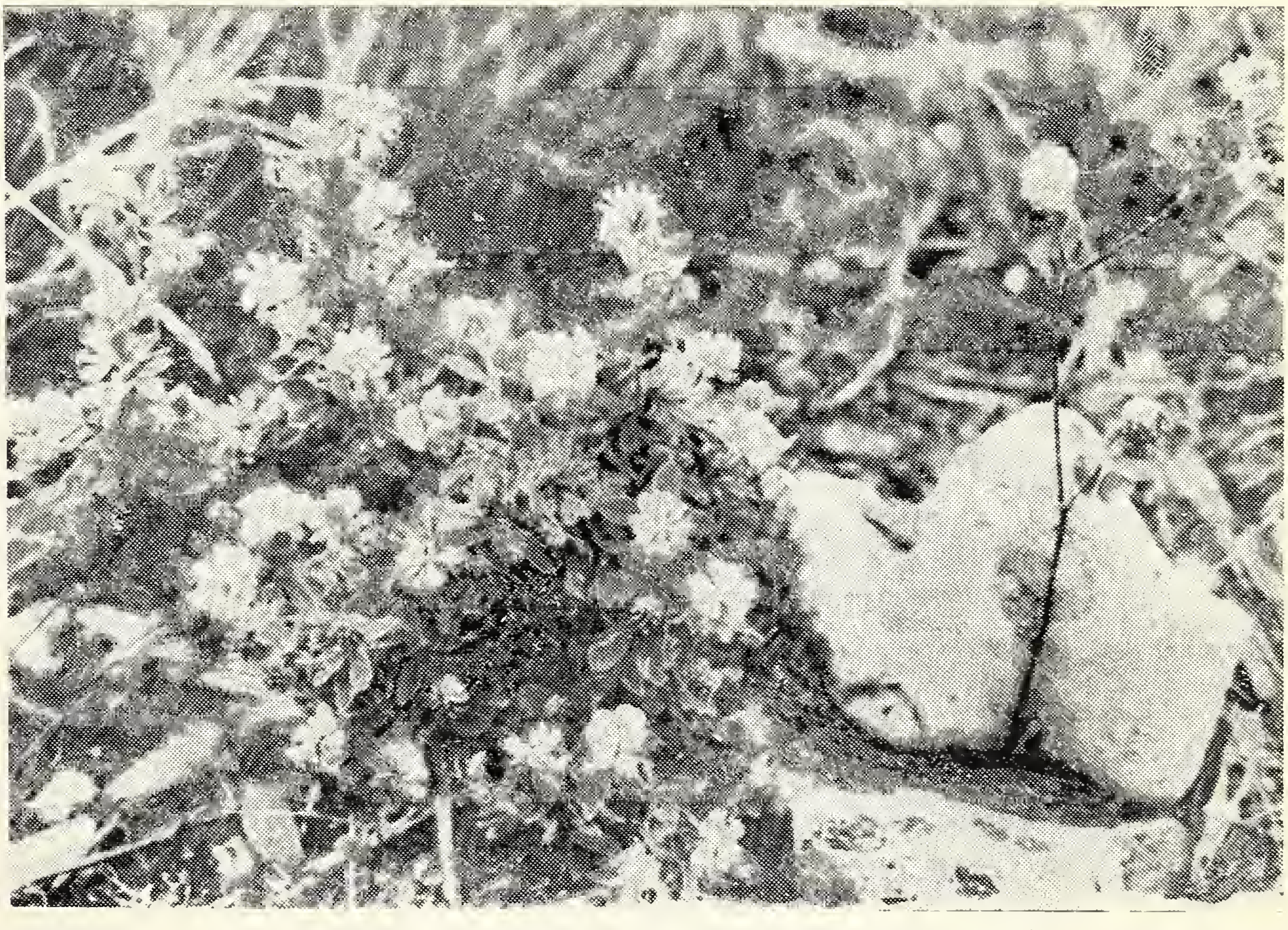
B. RECTA (L.) Rchb., DORYCNIUM RECTUM (L.) Ser. Alien. Europe. V.-c. 17. Bomb crater, Brockham Hill, 1948, *J.E.L.*; *Hb.L.*; 1949-50; *J.E.L.*

PLATE III.



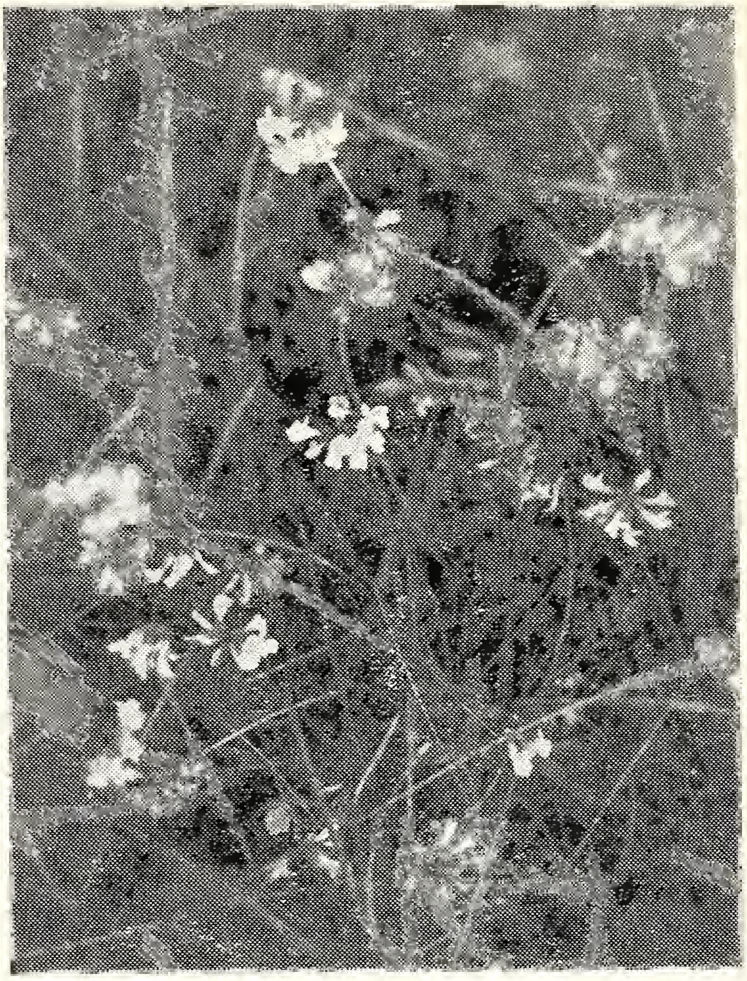
Small-flowered Balsam (*Impatiens parviflora* DC.). Norbury Park, Surrey, 1936.
W. H. Spreadbury.

BRITISH MUSEUM NATURAL HISTORY



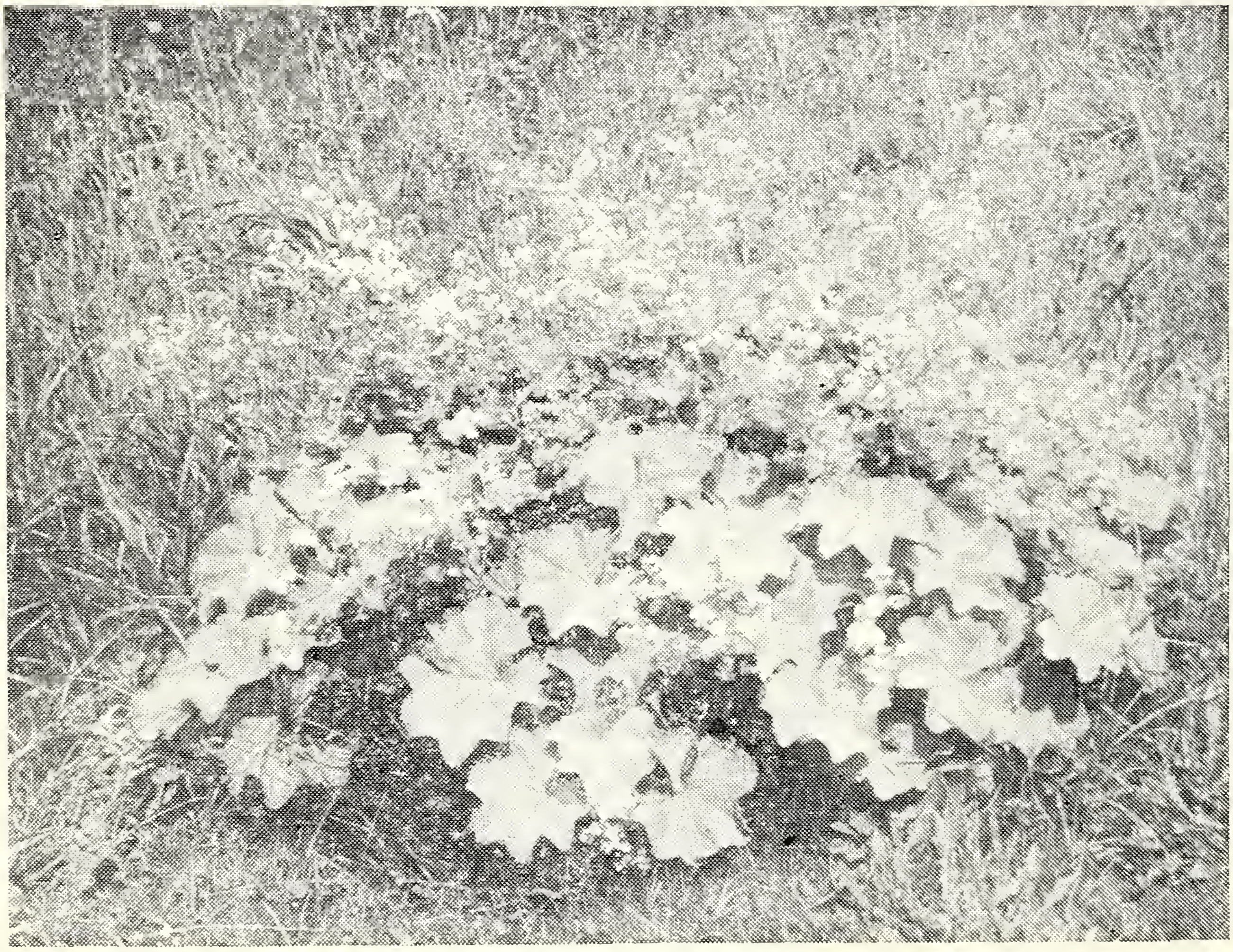
Trifolium aureum Poll. (left), and *T. campestre* Schreb. (right). Green Street Green, near Farnborough, Kent, 1937.
J. E. Lousley.

PLATE IV.



Horse-shoe Vetch (*Hippocrepis comosa* L.). Headley, Surrey, 1951.

J. E. S. Dallas.



Alchemilla mollis (Buser) Rothm. Box Hill, Surrey, 1948.

W. H. Spreadbury.

TETRAGONOLOBUS Scop.

T. MARITIMUS (L.) Roth., LOTUS SILIQUOSUS L. Alien. Europe. Naturalised in grassy places. Very rare. V.-c. 16. Stone Parish, one patch of a few plants on chalk, 1950-51; *H.M.P.*

LOTUS L.

L. ULIGINOSUS Schkuhr., L. MAJOR Scop. *Greater Bird's-foot Trefoil.* Damp heaths, commons, ditches, wet meadows, marshes and bogs. Common and well distributed in all the v.-cc.

L. CORNICULATUS L. *Common Bird's-foot Trefoil.* Downs, heaths, commons, pastures, railway banks and grassy roadsides. Frequent and well distributed. The var. INCANUS Gray is reported from v.-c. 16. Betsham, 1938; Swanscombe Wood, 1939, *P.H.C.*; *Hb.L.N.H.S.* It is probably a more common form than the records suggest.

L. TENUIS Waldst. & Kit. *Narrow-leaved Bird's-foot Trefoil.* Grassy roadsides, pastures and woodland clearings, chiefly on the clay. Very local, and often only casual. V.-c. 16. Plumstead and Stone Marshes, *F.J.H.*; *Fl. Kent*, 96. Swanscombe Wood, 1938, *P.H.C.*; very abundant; *F.R.*; 1946; *L.N.H.S. Excursion.* Near Orpington railway station; *W.W.* Littlebrook Marshes, 1930, *R.W.R.*; *Hb.R.* Mount's Wood; *F.R.* Lower Sydenham, 1948; *D.McC.* V.-c. 17. Gravel pit near Mitcham Junction railway station, 1933, *J.E.L.*; *Hb.L.* Waste ground by Hampton Court railway station, 1944; *B.W.* det. *J.E.L.* V.-c. 18. Chalkpit, Thurrocks, 1909, *P.H.C.*; *Hb.L.N.H.S.* Chalkpit, Grays, 1949, *J.E.L.*; *Hb.L.* V.-c. 21. Hackney Marshes, 1912 and 1915; near Yiewsley, 1919, *J.E.C.*; *Hb.Mus.Brit.* Waste ground, Golders Green, 1921; *P.W.R.* Waste ground between Hanwell and Southall, 1947, *F.E.W. & D.H.K.*; *Hb.K.*

L. ANGUSTISSIMUS L. *Slender Bird's-foot Trefoil.* Grassy places. Very rare. V.-c. 16. Stone Marshes; *W.W.*

GALEGA L.

G. OFFICINALIS L. *Goat's Rue.* Alien. Europe. A garden escape. Naturalised on waste ground and railway banks. Rather common, and apparently increasing. V.-c. 16. Erith Marshes, 1937, *P.H.C.*; *Hb.L.N.H.S.* Near Greenhithe, 1939; *P.H.C.* V.-c. 17. Chipstead; opposite Teddington; *P.H.C.* Mitcham Common, 1935, *J.E.L.*; *Hb.L.*; 1936, *P.H.C.*; *Hb.L.N.H.S.* Old Deer Park, Richmond, 1945; *B.W.* V.-c. 20. Boreham Wood, 1941; *J.B.* V.-c. 21. Railway bank, Finchley, 1943, *P.H.C.*; *Hb.L.N.H.S.* West Drayton; Isleworth; Hounslow Heath; Neasden; Stonebridge; Willesden Green; Hanwell; Chiswick; Wyke Green; Thames bank, Hammersmith; Isle of Dogs; Primrose Hill, plentiful, 1933-51; *D.H.K.* Ickenham, 1946; *F.E.W.* det. *D.H.K.* Hanger Hill, Ealing, in profusion, 1946; *F.P.D.B. & D.H.K.* The var. ALBIFLORA (Rouy) Brenan is reported from v.-c. 16. Stone Crossing, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Yiewsley, 1913-14, *J.E.C.*; *Hb.Mus.Brit.* Hanwell; canal bank near Springwell; Ealing Common; Hanger Hill, 1946-49; *D.H.K.*

ROBINIA L.

R. PSEUD-ACACIA L. *Black Locust, False Acacia.* Alien. N. America. A frequently planted tree in parks, plantations and recreation grounds. It seeds freely, and self-sown seedlings and saplings have been reported from v.-c. 17. Little Heath, near Oxshott, 1915; *E.B.B.* Box Hill, 1916; outside Esher Place, Cobham, 1918; between Headley and Ashtead, 1926; *L.J.T.* East side of Limpsfield Common, 1926, planted?; *R.W.R.* Wimbledon Common, 1948; *B.W.* V.-c. 21. Hampton Court, 1928; *L.J.T.* Colney Hatch Hospital grounds, numerous seedlings and saplings, 1945; *B.W. & D.H.K.* Laleham; *P.H.C.* Kensington Gardens; Zoological Gardens, Regents Park; East Heath, Hampstead; rubbish-tip, Hanwell, 1939-51; *D.H.K.*

COLUTEA L.

C. ARBORESCENS L. *Bladder Senna.* Alien. Mediterranean Region. Naturalised on railway banks, waste ground and rubbish-tips. Not uncommon. V.-c. 16. Greenhithe; *P.H.C.* Swanscombe chalkpit, 1950; *H.M.P.* V.-c. 17. Railway bank, Kew to Gunnersbury, *P.H.C.*; *Hb.L.N.H.S.*; 1951; *D.H.K.* Railway banks, Bermondsey; *P.H.C.* V.-c. 18. Grays, 1913, *P.H.C.*; *Hb.L.N.H.S.* Dagenham, 1930; *P.H.C.*; 1950; *D.H.K.* Railway banks, Bromley to Barking, 1939; *P.H.C. & J.H.G.P.* Along the railway from Fenchurch Street to Grays, 1945; *J.E.L.* Rubbish-tip near Ilford, 1951; *B.T.W.* V.-c. 21. Railway banks, Dalston; *C.S.N.* Railway banks, Upper Holloway, c. 1944; *R.S.R.F.* Railway banks, Gunnersbury, 1940, *P.H.C.*; *Hb.L.N.H.S.*; 1951; *D.H.K.* Burton's Court, Chelsea; near Southall; Northolt; Chiswick, frequent; Harrow; Hanger Hill; Osterley Park; Hounslow Heath; Isle of Dogs; Yiewsley; Hendon; North Acton; Hammersmith; bombed sites, Ebury Street, S.W.1, 1939-51; *D.H.K.* Waste ground by the railway near Willesden Junction, 1948; *R.A.B.*; 1951; *D.H.K.* Bombed sites, Cripplegate; *F.E.W.*

ASTRAGALUS L.

A. GLYCYPHYLLOS L. *Milk-Vetch.* Wood borders, bushy places and hedgebanks, almost confined to the chalk. Very local. V.-c. 16. Near Swanscombe, 1945, *P.H.C.*; *Hb.L.N.H.S.* Mount's Road, Greenhithe; *J.P.* teste *F.R.*; 1945; *F.R.*; 1946; *L.N.H.S. Excursion*; 1948-50; *H.M.P.* Darenth Wood, 1949; *H.M.P.* V.-c. 17. Hedgebank near Merstham, 1925, *E.C.W.*; White Hill, near Caterham, 1942, *J.E.L.*; *Hb.L.*; *E.C.W. & B.W.* Below Brockham lime works, 1950; *B.M.C.M. & J.E.L.* V.-c. 18. Purfleet, 1935, *P.H.C.*; *Hb.L.N.H.S.* Gone by 1936; *P.H.C.*

A. HAMOSUS L. Alien. Europe. V.-c. 24. Near Iver, 1916; *J.E.C.*

SCORPIURUS L.

S. SUBVILLOSA L. Alien. Europe. V.-c. 21. Fortis Green, 1911, *J.E.C.*; *Hb.Mus.Brit.*

CORONILLA L.

C. VARIA L. Alien. Europe. Naturalised on waste ground. Not common. V.-c. 16. Plumstead Marshes, 1915; *J.E.C.* Erith, 1937, *P.H.C.*; *Hb.L.N.H.S.* Greenhithe, 1937; *P.H.C.* Abbey Wood Marshes, 1951, *G.A.M.*; *Hb.Mus.Brit.* V.-c. 17. Chalkpit, Ewell, 1942. *A.E.E.*; *Hb.E.C.M.* Thames bank near Richmond, 1948; *R.A.B.* V.-c. 18. Dagenham, 1920; *L.B.H.* V.-c. 21. Uxbridge, 1903, *C.B.G.*; *Hb.S.L.B.I.* Waste land, The Hyde, Hendon, abundant, 1947-51, *D.H.K.*; *Hb.K.* V.-c. 24. Near Iver, 1913; *J.E.C.*

ORNITHOPUS L.

O. COMPRESSUS L. Alien. Europe. V.-c. 21. Clapton, 1912, *P.H.C.*; *Hb.L.N.H.S.*

O. PERPUSILLUS L. *Bird's Foot.* Heaths, commons, fields and roadsides on sandy and gravelly soils. Rather common. V.-c. 16. Frequent in the sandy and gravelly areas. V.-c. 17. Common in the sandy and gravelly areas. V.-c. 18. Epping Forest, 1871, *F.J.H.*; *Hb.Mus.Brit.*; *C.S.N.* High Beech; *L.B.H.* Brentwood, 1902; *R.W.R.*; near Wake Arms, 1910, *P.H.C.*; *Hb.L.N.H.S.* Hainault Forest, 1908; *P.H.C.* Bentley; Warley Common; *R.W.R.* V.-c. 20. Croxley Green, 1903; Broxbourne, 1909; *C.S.N.* Colney Heath, 1912. *P.H.C.*; *Hb.L.N.H.S.*; 1951; *F.R.* Wormley; Hoddesdon; *P.H.C.* V.-c. 21. Frequent in the sandy and gravelly areas.

HIPPOCREPIS L.

H. COMOSA L. *Horse-shoe Vetch.* Downs and banks on the chalk. Locally plentiful. V.-c. 16. Downe to Shoreham, 1928; *R.W.R.* Shoreham, 1951; *E.B.Ba.* Near Otford, 1940; *H.N.* V.-c. 17. Between Headley and Mickleham; Fetcham Downs, 1919; *E.B.B.* Tyrrell's Wood Golf Course, Headley, a small colony, 1951; *J.E.S.D.* Purley, *L.B.H.*; *Hb.H.* Downs above Oxted, local, 1919; Riddlesdown, 1929; *R.W.R.* Farthing Downs, Coulsdon, 1920; *W.W.*; 1935, *P.H.C.*; *Hb.L.N.H.S.* Warlingham, 1934; Reigate, 1941; *P.H.C.* Park Downs, Banstead, 1941; Walton Downs, 1927, *J.E.L.*; *Hb.L.*; 1938; *P.H.*C. Quarry Hangers, near Caterham, 1942; *B.W.*

ONOBRYCHIS Scop.

O. VICIIFOLIA Scop., O. SATIVA Lam. *Sainfoin.* Pastures, downs and railway banks on the chalk, also on field borders and waste ground as a relic of cultivation. Local, and sometimes only casual. V.-c. 16. Dartford, 1876. *F.J.H.*; *Hb.Mus.Brit.* Between Leaves Green and West Wickham, 1917; *P.H.C.* Near Eynsford, 1929; *R.W.R.* Railway bank, New Cross, 1946; *D.H.K.* Orchard between Farningham Wood and Village, 1951; *H.M.P.* V.-c. 17. Reigate, 1871, *F.J.H.*; *Hb.Mus.Brit.* Box Hill, 1901, *C.S.N.*; *Hb.L.N.H.S.* Woldingham, 1921; *R.W.R.*

Near Walton Downs, 1924, *E.C.W.*; *Hb.L.* Mitcham; Warlingham, 1936, *P.H.C.*; *Hb.L.N.H.S.* Quarry Hangers, near Caterham, 1942; Riddlesdown, 1949; *B.W.* V.-c. 18. Reservoir banks, Walthamstow; *R.W.R.* V.-c. 19. Roadside, Epping, 1951; *R.M.P.* V.-c. 20. Croxley Mills; *C.S.N.* West Hyde; *P.H.C.* V.-c. 21. Sunbury, 1903, *C.B.G.*; *Hb.S.L.B.I.* Harefield, 1913; *J.E.C.* Railway bank, Golders Green, 1909, *P.H.C.*; *Hb.L.N.H.S.* Warren Gate; *P.H.C.*; 1950; *D.H.K.* Springwell, 1944; railway bank between Ealing and Acton, 1946-49; rubbish-tip, Hanwell, 1945-50; *D.H.K.* Near Chertsey Bridge; South Mimms; *B.W.*

VICIA L.

V. sylvatica L. *Wood Vetch.* Woods, thickets and bushy places. Very rare. V.-c. 17. Near Fairoak Lane, Chessington; *B.E.C. 1934 Rep.*, 824 (1935). V.-c. 24. Near Uxbridge, 1912; *J.E.C.*

V. tenuifolia Roth. Alien. Europe. Naturalised on waste ground. Rare. V.-c. 17. Ham gravel pits, 1945; *J.E.L.*, *B.W.* & *D.H.K.* Warlingham, 1943, *J.E.L.*; *Hb.L.*

V. Cracca L. *Tufted Vetch.* Woods, hedgebanks, rough pastures, railway banks and waste places. Common and widely distributed. A small pubescent form noticed in v.-c. 17. Bookham Common, 1950, *C.P.C.* & *D.H.K.*; *Hb.K.* may come under var. incana Thuill.

*V. villosa Roth. Alien. Europe. V.-c. 17. Allotments, Limpsfield, 1925, *R.W.R.*; *Hb.B.* Epsom College, 1944, *A.E.E.*; *Hb.E.C.M.* V.-c. 18. Grays, 1909, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. East Finchley, 1908: Yiewsley, 1914; *J.E.C.*, *Hb.Mus.Brit.* Greenford, 1920; *J.E.C.* Waste ground, Chiswick, 1939, *J.E.L.*; *Hb.L.*; 1946, *J.E.L.*, *B.W.* & *D.H.K.* Rubbish-tip, Hanwell, 1946-47; abundant among crops near Southall, 1948, *D.H.K.* Among crops, Ken Wood, 1948, *J.E.L.*, *H.C.H.* & *D.H.K.*; *Hb.K.* V.-c. 24. Near Iver, 1915-18; *J.E.C.*

*V. dasycarpa Tenore, V. varia Host., V. villosa var. glabrescens Koch. Alien. Europe. V.-c. 17. Cornfield near the Long Plantation, Chipstead, 1950; *B.W.*; *Hb.L.* Abundant in a field of oats, Chelsham, *D.P.Y.*; *Watsonia*, 2, 196 (1952). V.-c. 18. Dagenham Dock, 1927; *J.E.C.* V.-c. 21. Acton, 1907, *C.B.G.*; *Hb.S.L.B.I.* Abundant among crops, Ken Wood, 1948, *H.C.H.* & *D.H.K.*; *Hb.K.* Hendon, 1912, *P.H.C.*; *Hb.L.N.H.S.* Yiewsley, 1913, *J.E.C.*: *Hb.Kew.*

**These species should perhaps be combined, as is done in some continental floras.*

V. sepium L. *Bush Vetch.* Hedges, woods, banks and copses. Common and widely distributed.

V. lutea L. *Yellow Vetch.* Alien. Europe, including parts of Britain. V.-c. 21. Roadside near Scratch Wood, Edgwarebury, 1948; *H.C.H.* teste *J.E.L* The var. hirta Lois. is reported from v.-c. 21. Yiewsley, 1912 and 1923; near Temple Fortune, 1915, *J.E.C.*; *Hb.Mus.Brit.*

V. hybrida L. Alien. Europe. V.-c. 16. Railway bank E. of Swanley; *W.W.*

V. SATIVA L. *Cultivated Vetch.* Cultivated as a fodder crop, and found as a relic on field borders and as an escape on waste ground, rubbish-tips and by roadsides. Recorded from all the v.-cc. except 19.

V. ANGUSTIFOLIA (L.) Reichard. *Wild Vetch.* Heaths, commons, downs, fields, roadsides, railway banks and waste ground. Common and well distributed. Plants with white flowers are recorded from v.-c. 21. Meadow at Dawley, abundant, 1947; *D.H.K.*; *Hb.K.*

V. LATHYROIDES L. *Spring Vetch.* Sandy heaths and commons. Very rare. V.-c. 16. Dartford Heath, *F.J.H.*; *Fl. Kent*, 102. V.-c. 17. Wimbledon Common, 1948; *C.A.* conf. *J.E.L.*

V. BENGHALENSIS L., V. ATROPURPUREA Desf. Alien. Europe. V.-c. 21. Hackney Marshes, 1915; *J.E.C.*

V. PSEUDO-CRACCA Bert. Alien. S. Europe. V.-c. 21. Finchley, 1909, *J.E.C.*; *Hb.Mus.Brit.* Crouch End, 1897; Yiewsley, 1911-14; Hackney Marshes, 1912-13; Temple Fortune, 1914; *J.E.C.*

V. NARBONENSIS L. Alien. Europe. V.-c. 21. South Mimms, 1911, *P.H.C.*; *Hb.L.N.H.S.*

V. PANNONICA Crantz. Alien. Europe. V.-c. 17. One plant in an oat field, Chelsham, *D.P.Y.*; *Watsonia*, 2, 196 (1952). V.-c. 18. Monkham's Estate, Woodford, 1907; *C.N.* Dagenham Dock, 1927; *J.E.C.* The var. PURPURASCENS (D.C.) Boiss. is reported from v.-c. 21. Waste ground near Acton, 1907, *C.B.G.*; *Hb.S.L.B.I.*

V. PEREGRINA L. Alien. Alien. Europe. V.-c. 18. Near Leyton, 1927; *J.E.C.* V.-c. 21. Hackney Marshes, 1912; *J.E.C.*

V. CASSUBICA L. Alien. Europe. Naturalised in a chalkpit. V.-c. 16. Near Greenhithe, 1931, *F.D.*; *J. Bot.*, *70*, 52 (1932); 1946; *F.R.*; *L.N.H.S. Excursion*; 1950; *H.M.P.*; 1951; *F.R.*, *R.C.L.B.*, *R.A.G.* & *D.H.K.*

V. VESTITA Bois. Alien. Europe. V.-c. 21. Hackney Marshes, 1912, *J.E.C.*; *Hb.Kew.*

V. HIRSUTA (L.) S. F. Gray. *Hairy Tare.* Hedgebanks, woods, thickets, cultivated and waste ground. Frequent and widely distributed in all the v.-cc.

V. TETRASPERMA (L.) Schreb. *Smooth Tare.* Woods, thickets, hedgebanks, railway banks, cultivated and waste ground. Common and well distributed in all the v.-cc. except 19, where it is so far unrecorded.

V. TENUISSIMA (Bieb.) Schinz & Thell., V. GRACILIS Lois. *Slender Tare.* Cultivated ground. Very rare, and possibly only casual. V.-c. 21. Garden weed, Ealing, 1949, *T.G.C.*; *Hb.K.*

LENS Mill.

LENS CULINARIS Medik. *Lentil.* Alien. Mediterranean Region. V.-c. 16. Beckenham Park Place, 1934, *E.J.B.*; *Hb.L.*

LATHYRUS L.

L. LATIFOLIUS L. *Everlasting Pea.* Alien. S. Europe. A garden escape, naturalised on railway banks and waste ground. Not common. V.-c. 16. Railway banks, St. Mary Cray and Bickley, 1946, *P.H.C.*; *Hb.L.N.H.S.* Gravel pit near Stone Castle, 1947, *J.E.L.*; *Hb.L.*; 1950; *H.M.P.* V.-c. 17. Waste ground, Epsom Sewage Farm, *A.E.E.*; *B.E.C. 1938 Rep.*, 39 (1939). Burdon Lane, Banstead Downs, known here for over twenty years, *E.C.W.*; *B.E.C. 1945 Rep.*, 39 (1946). V.-c. 21. Waste ground, Yiewsley; Hanwell; railway banks, West Acton, Hounslow and Enfield; banks of Belmont Pond, Uxbridge Common, 1933-49; *D.H.K.* Waste ground, Chiswick, abundant; *B.W.*; *D.H.K.* Fox Reservoir, Ealing, abundant; *F.P.D.B.*; 1946-51; *D.H.K.*

L. SYLVESTRIS L. *Narrow-leaved Everlasting Pea.* Wood borders and banks. Very local. V.-c. 16. Swanscombe Wood, 1919, *P.H.C.*; *Hb.B.*; 1938; *P.H.C.*; 1945; *F.R.*; 1946; *L.N.H.S. Excursion*; 1947 (a broad-leaved form), *J.E.L.*; *Hb.L.* Near Southfleet, 1945; *F.R.* V.-c. 17. Near Merstham, 1905; *J.E.C.*; 1921, *R.W.R.*; *Hb.B.*; 1949, *J.E.L.* Near Arthur's Seat, Caterham, 1924, *J.E.L.*; near Rockshaw, 1931, *E.C.W.*; *Hb.L.* Near Banstead; *P.H.C.* V.-c. 21. Near Scratch Wood, Edgwarebury, 1946, *J.Si.*; *Hb.K.*

L. TUBEROSUS L. *Tuberous Pea.* Alien. Europe, including parts of Britain. Naturalised in grassy places, and on banks. Very rare. V.-c. 17. Barrow Green Woods, Oxted, 1926, *R.W.R.*; *Hb.R. & L.N.H.S.*; it could not be found in 1928; *R.W.R.* V.-c. 21. Embankment of Thames, Chiswick, 1933, *E.B.Ba.*; *Hb.Mus.Brit. & Hb.S.L.B.I.*; still there 1937, *E.B.Ba.*; *B.E.C. 1937 Rep.*, 474 (1938); not there in 1940; *D.H.K.* West Middlesex Golf Course, Hanwell, 1950, *E.A.B.*; *Hb.K.*

L. PRATENSIS L. *Meadow Vetchling.* Downs, pastures, railway banks and grassy places. Common and widely distributed.

L. HIRSUTUS L. Alien . Europe. V.-c. 17. Chalky bank near Caterham, 1883, *F.J.H.*; *Hb.Mus.Brit.* Hanbury's specimen doubtless came from the well-known locality in the Halliloo Valley (near Caterham) whence it was first recorded in 1863. It was confirmed here at intervals until 1931 but we have no evidence that it has been seen since then. C. E. Salmon and others have accepted it as native in this station. V.-c.18. Allotments, Chingford, *Dr. Axford*; *Hb.L.N.H.S.* V.-c. 21. Crouch End, 1897; Finchley, 1909; Hackney Marshes, 1912-13, *J.E.C.*; *Hb.Mus.Brit.* Mimms Hall, 1909, *C.B.G.*; *Hb.S.L.B.I.* V.-c. 24. Near Iver. 1918-19; *J.E.C.*

L. NISSOLIA L. *Grass Vetchling.* Field and wood borders, banks and grassy places. Local, and varying greatly in quantity from year to year. V.-c. 16. Eltham Park; near Farnborough; *W.W.* Between Bickley and Petts Wood, 1944; *J.E.L.* Orpington, plentiful; Dartford Marsh, 1931; *P.H.C.* Greenhithe, 1947; *D.H.K.* Stone Marshes, 1949-50; *D.H.K.* V.-c. 17. Mortlake, 1916; *J.E.C.* Limpsfield, very local, 1921; Riddlesdown, 1928; *R.W.R.* Near Chipstead railway station, 1923; Mitcham Common, 1927; Croydon Lane, Banstead, 1931, *J.E.L.*; *Hb.L.* Near Woldingham, c. 1930; *J.E.L.* Chaldon, 1935; Ashtead, 1940; *P.H.C.*; 1944, *P.H.C.*; *Hb.L.N.H.S.* Cemetery at Thornton Heath, 1935; *L.P.* Wimbledon Common, 1943; *B.W.* Leatherhead, 1948; *J.E.S.D.* V.-c. 18. Epping, *L.B.H.*; *Hb.H.* Hainault Forest, 1908; Brook Street, Brentwood, 1913; *P.H.C.* V.-c. 20. Wormley West End, 1906; *R.W.R.* Near Abbots Langley, 1907; *L.J.T.* Near Cuffley, 1919; *L.B.H.* V.-c. 21. Edgware, 1899, *E.M.D.*; near Hadley, 1906, *H.C.*; *Hb.L.N.H.S.* The Hale, Mill Hill, 1918-21; Dawley, 1919; *J.E.C.* Near Edgware; Harefield, locally abundant; Staines Moor; Hanwell; Southall; Osterley Park, 1944-51; *D.H.K.* Stanwell Moor; near Wyke Green; *B.W.* & *D.H.K.* South Ruislip, 1946; *F.E.W.* Scratch Wood; *H.C.H.* V.-c. 24. Near Denham, 1930, *P.H.C.*; *Hb.L.N.H.S.*

L. Aphaca L. *Yellow Vetchling.* Alien. Europe, including various parts of Britain. Naturalised on waste ground and by roadsides, it also occurs as a casual on cultivated ground. Very rare. V.-c. 16. Chalkpit, Greenhithe, 1950; *R.A.B.* Gravel pit, Green Street Green, V.-c. 17. Nork Park, Banstead, 1939, *J.W.P.**; Banstead Downs, 1939, *A.W.T.*†; *Hb.E.C.M.* V.-c. 18. Dagenham Dock, 1927; *J.E.C.* V.-c. 20. Broxbourne, 1907; *P.H.C.* V.-c. 21. Gravel pit, Uxbridge, 1907, *C.B.G.*; *Hb.S.L.B.I.* East Finchley, 1909; Hackney Marshes, 1909 and 1912; Yiewsley, 1912 and 1914, *J.E.C.*; *Hb.Mus.Brit.*

L. inconspicuus L. Alien. S. Europe. V.-c. 21. Hackney Marshes, 1912 and 1915, *J.E.C.*; *Hb.Mus.Brit.*

L. setifolius L. Alien. S. Europe. V.-c. 16. Beckenham Park Place, 1934, *E.J.B.*; *Hb.L.*

L. Cicera L. Alien. Europe. V.-c. 21. Hackney Marshes, 1912; *J.E.C.*

L. montanus (L.) Bernh., L. macrorrhizus Wimm., Orobus tuberosus L. *Tuberous Bitter-vetch.* Woods, thickets, banks, heaths and rough pastures. Locally abundant. V.-c. 16. Stone Wood, near Darenth, 1919; Chelsfield to Shoreham, 1930; Hayes Common, 1936; *P.H.C.*; 1938; *D.McC.* Near Brasted Chart, 1913; *E.B.B.* Westerham Hill, 1938, *M.M.W.*; *Hb.L.N.H.S.* V.-c. 17. Oxted, 1917; Limpsfield; *R.W.R.* Ashtead to Bookham, 1935; Epsom to Ashtead; Chaldon, 1935; *P.H.C.* Epsom Common, 1939, *P.H.C.*; *Hb.L.N.H.S.* Richmond Park; Wimbledon Common 1943; *B.W.* V.-c. 18. Woodhatch, 1908, *C.S.N.*; between Chingford and High Beech; Sewardstone, 1909, *P.H.C.*; *Hb.L.N.H.S.* Lambourne; *R.W.R.* Loughton, 1951; *R.M.P.* V.-c. 19. Green lane leading from Epping Forest through Woodredon, near Upshire, 1950; *B.T.W.* V.-c. 20. Bricket Wood, 1909; Colney Heath, 1912, *C.S.N.*; *Hb.L.N.H.S.* Hertford Heath; *S.C.M.* V.-c. 21. Highgate Woods, 1886; *J.E.C.* Coldfall Wood, Highgate; *E.M.D.* Hadley Wood, 1898, *E.M.D.*; *Hb.L.N.H.S.*; 1946; *D.H.K.* Uxbridge; Park Wood, Ruislip; *P.H.C.*; *D.H.K.* Stanmore Common, very scarce, 1946,

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*Poulton, J. W. †Tomlinson, A. W.

D.H.K.; *Hb.K.* V.-c. 24. Denham, 1934; *P.H.C.* The var. TENUIFOLIUS Garcke is reported from v.-c. 21. Ruislip Woods, *C.B.G.*; *Hb.S.L.B.I.*

GLYCINE L.

G. SOJA Sieb. & Zucc. *Soya Bean.* Alien. Japan. V.-c. 21. Forecourt of Soya Foods Ltd., Springwell, 1945, *D.H.K.*; *Hb.K.*

PISUM L.

P. ARVENSE L. *Field Pea.* Alien. Europe. Escape from cultivation. V.-c. 18. Dagenham Dump, 1934, *J.E.L.*; *Hb.L.* V.-c. 21. Hackney Marshes, 1945; *D.H.K.*

P. SATIVUM L. *Garden Pea.* Alien. Near East. Garden outcast. V.-c. 21. Bombed site near Baldwin's Gardens, E.C.1, 1950, *J.W.*; *Hb.Mus.Brit.*

PHASEOLUS L.

P. VULGARIS L. *Dwarf Bean.* Alien. Escape from cultivation. V.-c. 21. Forecourt of Soya Foods Ltd., Springwell, 1945-47, *D.H.K.*; *Hb.K.*

CASSIA L.

C. FISTULA L. Alien. Tropical Asia. V.-c. 21. Yiewsley, 1934, *J.E.L.*; *Hb.L.*

ROSACEAE

PRUNUS L.

P. PADUS L. *Bird Cherry.* Alien. Europe, including many parts of Britain. Planted in woods, plantations and hedges. Rare. V.-c. 16. Lullingstone, *F.J.H.*; *Fl. Kent*, 107. V.-c. 17. Limpsfield; *R.W.R.* V.-c. 18. Cooks Folly Wood, 1900, *R.W.R.*; *Hb.L.N.H.S.* V.-c. 21. Harlington, 1904; *C.B.G.* East Heath, Hampstead; *C.H.A.* Near Denham Lock; *D.H.K.* Grounds of Ashford County Hospital; *J.K.H.*

P. AVIUM L. *Gean, Wild Cherry.* Woods, plantations and hedges. Common and widely distributed in all the v.-cc.

P. CERASUS L. *Sour Cherry.* In similar situations to the preceding species. Rare, overlooked, or confused with P. AVIUM. V.-c. 16. Farnborough, 1938; *P.H.C.* V.-c. 17. Wimbledon Common, 1938, *P.H.C.*; *Hb.L.N.H.S.* Between Merstham and Gatton, one plant, 1935; *P.H.C.* V.-c. 21. Coldfall Wood; *E.M.D.* Highgate Woods; *C.S.N.* Bushey Heath; *P.H.C.* Northwood, 1938, *P.H.C.*; *Hb.L.N.H.S.* Harefield; Yiewsley; Cowley; Wyke Green; Southall 1944-49; *D.H.K.*

P. DOMESTICA L. *Wild Plum.* Alien. Europe. Naturalised in hedges and plantations. Rare. V.-c. 16. Near Lullingstone, *F.J.H.*; *Fl. Kent*, 106. Crofton Court to Orpington, 1923; *E.B.B.* Downe, 1937, *J.E.L.*; *Hb.L.* V.-c. 17. By River Thames near Richmond Bridge, 1919; *L.J.T.* teste *R.W.R.* Downs near Oxted, 1923; *R.W.R.* Near Headley, 1926; *L.J.T.* Addington, 1926, *A.L.S.*; *Hb.L.* Limpsfield, *R.W.R.*; *Lond. Nat.*, *19*, 66 (1940). Putney Heath, 1937; *C.A.* V.-c. 21. Ruislip Woods; *P.H.C.* Several trees by the railway near Isleworth, 1946; *D.H.K.*

P. INSITITIA L. *Bullace.* Hedges. Local. V.-c. 16. St. Paul's Cray, 1917; *P.H.C.* Near Otford, 1922; *L.J.T.* Darenth, 1948-51; *H.M.P.* V.-c. 17. Near Leatherhead, 1916; *E.B.B.* Limpsfield and Limpsfield Chart, 1917; *R.W.R.* Arbrook Common, 1932; Wimbledon Common, 1938; Sutton Common, 1937; Mitcham, 1931 and 1938; *P.H.C.* Ashtead, 1934; *J.R.* Woodcote Park, Epsom, 1938, *E.C.W.*; Limpsfield Common, 1937-38; near Farleigh, 1942, *J.E.L.*; *Hb.L.* V.-c. 18. Near Ockendon, 1909, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 19. Galley Wood, 1909, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. Cheshunt, 1909; Broxbourne; *P.H.C.* V.-c. 21. Hampstead Heath, two trees, 1906; *C.S.N.* West Drayton, 1910; *P.H.C.*; 1944; Dawley; Uxbridge, 1945; *D.H.K.*

P. SPINOSA L. *Blackthorn, Sloe.* Hedges and wood borders. Common and widely distributed throughout the area. The var. MACROCARPA Wallr. is reported from v.-c. 20. Broxbourne, 1924; *E.B.B.* V.-c. 21. West Drayton, 1944; *D.H.K.* A monstrous form with double fruits was noted in v.-c. 21. Mill Hill, 1922; *J.E.C.*

P. CERASIFERA Ehrh. *Cherry-Plum.* Alien. Orient. Naturalised in hedges. Rare, or overlooked. V.-c. 21. Pinner; South Mimms, 1944; *D.H.K.* Uxbridge Common, 1946; *F.E.W.* Laleham; near Staines, 1947; Hounslow Heath, 1948; Wyke Green, 1950; *D.H.K.*

P. ARMENIACA L. *Apricot.* Alien. China. V.-c. 21. Bombed site, High Holborn, W.C.1, a seedling, 1950, *J.W.*; *Hb.Mus.Brit.*

SPIRAEA L.

S. DOUGLASII Hook. Alien. N. America. A garden escape naturalised in woods, plantations and grassy places. Rare. V.-c. 17. Bookham Common, 1950, *D.H.K.*; *Hb.K.* V.-c. 21. Scratch Wood, abundant, 1944-51; *D.H.K.*

S. SALICIFOLIA L. Alien. Europe. A garden escape naturalised in woods, plantations, waste places, and by roadsides. Rare. V.-c. 17. Roadside near Chertsey; *L.B.H.* V.-c. 18. Whitehall Plain, Epping Forest, 1934; *J.R.*; 1943, *J.R.*; *Hb.L.N.H.S.*

PHYSOCARPUS Maxim.

P. OPULIFOLIUS (L.) Maxim, SPIRAEA OPULIFOLIA L. Alien. N. America. Naturalised in woods. Very rare. V.-c. 17. Wood between Claygate and Oxshott, 1943, *N.Y.S.*; *Hb.Mus.Brit.*

FILIPENDULA B. Ehrh.

F. ULMARIA (L.) Maxim, SPIRAEA ULMARIA L. *Meadow Sweet.* Stream banks, marshes and damp meadows. Common and widely distributed in all the v.-cc. The var. DENUDATA auct. angl. is reported from v.-c. 16. N. of Sevenoaks, 1951; *D.McC.* V.-c. 17. Weybridge, 1919; by Leatherhead Mill Pond, 1918; Barley Common, near Effingham Junction, 1919; *E.B.B.* Robin Wood, Oxshott, 1942, *P.H.C.*;

Hb.L.N.H.S. V.-c. 18. Ching Brook, Epping Forest, 1943, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. By Frays River, N. of Uxbridge; Ickenham, 1922; *L.J.T.* Between Northolt and Ickenham; *D.H.K.* Plants with double flowers were found in v.-c. 21. Warren Gate, 1910, *P.H.C.*; *Hb.L.N.H.S.*

F. VULGARIS Moench., SPIRAEA FILIPENDULA L. *Drop Wort.* Downs and grassy places, with a marked preference for calcareous soils. Local. V.-c. 16. Darenth; *W.W.* V.-c. 17. Fetcham and Mickleham Downs, 1916: *E.B.B.*; 1951, sparingly; *J.E.S.D.* Near Reigate, 1917; *E.B.B.* Banstead Downs; *W.W.*; 1929, *R.W.R.*; 1938, *P.H.C.*; *Hb.L.N.H.S.* Park Downs, Banstead, 1941, *J.E.L.*; *Hb.L.* Riddlesdown; Farthing Downs; *W.W.*; 1935; *P.H.C.* Epsom Downs, 1934; *R.W.R.* Chipstead Valley, 1941, *J.E.L.*; *Hb.L.* Chelsea and Lambeth Reservoirs, Walton Road, 1946; *W.J.L.S.* Mitcham Common, 1938; *J.B.E.* Richmond Park, 1946; *B.S.* Box Hill, 1948; *M.B.G.** V.-c. 21. Hampton Court Home Park, 1928; *L.J.T.*; in two places, 1939-51; *D.H.K.* Near Sunbury, 1945; *B.W.* Waste ground, Hanwell, 1949-51, *D.H.K.*; *Hb.K.*

*RUBUS L.

*(We are greatly indebted to Mr. W. C. R. Watson for preparing the following account of the Brambles. His long study of the group is now culminating in a complete revision of the British *Rubi* and earlier arrangements and determinations are superseded to an extent which renders them almost valueless for a work of this kind. It would therefore have been impossible for us to have dealt with the genus as known in the London Area without his help. At Mr. Watson's express request his account includes descriptions of new species, new combinations and additions to the British list. *D.H.K.* & *J.E.L.*)

By W. C. R. WATSON.

The records that follow are, with few exceptions which are specified in the list, from my personal observation in the field in the last thirty years. The County Floras and Rogers's *Rubi of the Neighbourhood of London* (*J. Bot.*, *41*, 87-97 (1903)) have been consulted with interest but have not been laid under contribution. The herbaria of J. T. Powell (Essex), now at Stratford Museum, J. Benbow (Middlesex & Bucks.), now in *Herb. Mus. Brit.*, C. E. Britton (Surrey and Essex mostly)† and A. H. Wolley-Dod (N.W. Kent and Surrey), now in *Herb. Mus. Brit.* have been examined and have here and there furnished the occasion for a reference in the present list. In general, however, their stations had already been visited by me and the species they had found were already listed. Some species wrongfully claimed in the foregoing sources to have been found in the area have been mentioned in order to be dismissed.

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*Gerrans, Miss M. B.

†C. E. Britton's *Rubi* are partly in the possession of the author, and partly at Kew. Many sheets were however distributed through various Botanical Exchange Clubs.

In the case of Middlesex, Bucks., and much of Surrey and Herts. I have had the assistance of Mr. C. Avery of Fulham and he has been the first finder of several of the species here recorded for those counties. Hardly a year has passed without his bringing me some fresh species to be added to the list, and in all such cases I have seen the growing species in his company. In a few cases I have accepted his records for well known species without myself seeing a specimen, knowing that his judgment in such cases was entirely dependable. Many of the records for Surrey, Bucks. and Middlesex therefore are our joint records.

Hybrids are rather frequent but have not been recorded, with the exception of fertile crosses of R. ULMIFOLIUS, which might be mistaken for species: they are usually confined to a single clump, or a few locally scattered clumps of bushes.

The cultivated species R. LACINIATUS Willd. and R. PROCERUS P. J. Muell. are frequently met with, bird-sown, not far from gardens. R. IDAEUS L. is often of the same category. R. ALLEGHENIENSIS Porter is rare, but persists. R. PHOENICOLASIUS Maxim is occasionally seen, and likewise the *loganberry.*

R. IDAEUS L. *Raspberry.* Frequent, usually if not always outcast or bird-sown from gardens, in two forms, one with a finely pubescent, the other with a glabrous stem.

var. ANOMALUS Arrhen. A unisexual, male form, found near gardens, from which presumably, being infertile, it has been thrown out. V.-c. 16. Barnet Wood, Hayes. V.-c. 18. Near the Owl Inn, Epping Forest.

var. ASPERRIMUS Ed. Lees. Rare. A garden escape. V.-c. 16. Chislehurst Common.

R. CAESIUS L. *Dewberry.* Rather frequent in low lying, wet places; more rare in woods and in chalky field margins. A distinct, pentaploid form occurs in v.-c. 21. by the Pinn Brook, west of Swakeleys. Another, large, rugose-leaved form, also sometimes pentaploid, occurs abundantly in N.W. Kent, and has been noted in v.-c. 24 at Tatling End, Denham. Other varieties occur, but are difficult to identify owing to the incompleteness of authors' descriptions. (The genetic behaviour of this Linnean 'species' calls for close investigation.)

R. NESSENSIS W. Hall. V.-c. 16. Paul's Cray and Hayes Commons; Pett's Wood; Holwood Park; Barnet Wood, Hayes; Broomfield Wood, 610′, near Knockholt. V.-c. 17. Springpark Wood; Moorhouse Bank; The High Chart; Tilburstow Hill Common; Reigate and Headley Heaths; St. Ann's Hill. V.-c. 24. Wood W. of Alderbourne Farm, abundant.

R. SCISSUS W. Wats. V.-c. 16. Chislehurst and Paul's Cray Commons; Petts Wood. V.-c. 17. The High Chart, N.W. of Kent Hatch at 600′. V.-c. 18. Barracks Wood, Warley.

R. plicatus W. & N. V.-c. 16. Chislehurst and Paul's Cray Commons; Petts Wood; Barnet Wood, Hayes. V.-c. 17. Barnes, Palewell and Sheen Commons; Banstead and Reigate Heaths; The High Chart; Limpsfield, Arbrook, Walton and Weybridge Commons.

R. nitidus W. & N. V.-c. 16. By the River Darenth at Dartford, 1827, *J. Henslow* in *Hb. Brit. Linn. Soc.* as R. plicatus. V.-c. 17. West End Common, Esher; Arbrook Common.

R. fissus Lindl., R. Rogersii Linton. V.-c. 16. Hayes, Farnborough and Keston Commons; Barnet Wood, Hayes.

R. integribasis P. J. Muell. V.-c. 17. Ditton Marsh; Littleworth and Weybridge Commons. Walton Common, at the turning to Weybridge, 1903, *W.-Dod* as R. opacus f. minor.

R. affinis W. & N. The plant recorded as R. affinis in *Fl. Kent*, 111, for v.-c. 16. Plumstead, was R. gratus. V.-c. 17. Barnes, Wimbledon and Weybridge Commons.

R. nobilissimus W. Wats. V.-c. 17. Littleworth, Arbrook and Walton Commons. Fairmile Common, 1908, *W.-Dod* as R. opacus.

R. ammobius Focke. V.-c. 17. Fairmile Common, E. of the main road, against the bus stop, in some plenty.

R. Sprengelii Weihe. V.-c. 16. Shooters Hill; Shrewsbury Park; Hayes, Keston and Hosey Commons; Squerryes Park, near Westerham. V.-c. 17. The High Chart; The Chart, quarry; Tilburstow Hill Common. V.-c. 18. Epping Forest, in several spots; Warley Common; about Coxtie Green. V.-c. 21. Hampstead Heath; Harrow Weald and Stanmore Commons; Scratch Wood.

R. Braeuckeri G. Braun. V.-c. 16. Squerryes Park, near Westerham.

R. chaerophyllus Sag. & W. Schultze. V.-c. 16. French Street. V.-c. 21. Arnos Grove.

R. Crespignyanus W. Wats. V.-c. 17. Addington Hills; Ballards Plantation; Littleheath Wood; Croham Hurst.

R. calvatus Ed. Lees ex Blox. in Kirby. V.-c. 16. French Street. V.-c. 17. Putney Heath, extinct; Reigate Heath.

R. rhodanthus W. Wats. V.-c. 16. Shooters Hill; Chislehurst Common; Dartford Heath. V.-c. 17. Mitcham, Wimbledon, Barnes, Littleworth and Arbrook Commons; Ashtead Forest; Limpsfield Common; St. Ann's Hill. V.-c. 18. Broad Strood, Epping Forest. V.-c. 21. Hampstead Heath; Harrow Weald and Stanmore Commons; Scratch Wood; Hounslow Heath. V.-c. 24. Black Park.

R. CARPINIFOLIUS W. & N. V.-c. 16. Chislehurst, Hayes and Hosey Commons; Bickley; Dartford Heath. V.-c. 17. Putney Heath; Palewell, Ham, Streatham, Tooting and Mitcham Commons; Springpark Wood; Arbrook, Fairmile and Great Bookham Commons; West End Common, Esher. V.-c. 18. Hainault, and Epping Forest near Woodford, both fide *C. Avery.* V.-c. 21. Hampstead and Hounslow Heaths; Stanmore Common; Park Wood, Northwood; Swakeleys; Copse Wood.

R. MERCICUS Bagn. V.-c. 16. Hayes and Keston Commons; Barnet Wood, Hayes. V.-c. 17. Putney Heath.

R. NITIDOIDES W. Wats. V.-c. 16. Hayes, Chislehurst and Keston Commons; Barnet Wood, Hayes; Holwood Park; Pickhurst Green. V.-c. 17. Putney Heath; Wimbledon and Mitcham Commons; Addington Hills; Headley Heath. V.-c. 18. Warley Common; Barracks Wood and Shrub Hill, Warley. V.-c. 21. Hampstead Heath; Horsendon Hill.

R. VULGARIS W. & N. V.-c. 16. Dartford Heath. V.-c. 17. Ditton Marsh; Littleworth and Arbrook Commons; West End Common, Esher; Fairmile and Horsell Commons. V.-c. 24. Parkspring Wood; Fulmer Road, Iver Heath, W. of the church.

R. LATIARCUATUS W. Wats. V.-c. 17. Putney Heath. V.-c. 24. Black Park; Langley Park, near the Slough road; Parkspring Wood.

R. GLANDULIGER W. Wats. V.-c. 16. Chislehurst Common, near St. Nicholas Church, one clump under a holly tree; believed to have been introduced by a woodcock about 1937, from Sussex.

R. CONFERTIFLORUS W. Wats. V.-c. 16. Chislehurst, Hayes and Keston Commons. V.-c. 17. Banstead Heath; Fairmile Common, near R. AMMOBIUS; Walton Common.

R. GRATUS Focke. V.-c. 16. Shrewsbury Park; Plumstead, Eltham, Chislehurst and Hayes Commons; Bostall Heath; Springpark Wood. V.-c. 17. Putney Heath, in *Hb. Rogers.* Tooting, Streatham and Mitcham Commons; Banstead Heath; Tilburstow Hill Common; Burgh and Walton Heaths. V.-c. 18. Epping Forest, near Woodford. V.-c. 21. Hampstead Heath. V.-c. 24. Between Alderbourne Farm and Dromina (Dromenagh), in *Hb. Benbow.*

R. LINDLEIANUS Ed. Lees. Noted as rather frequent in all the v.-cc., on clay as well as on sand; occasionally in hedges and wood borders, more often on heaths and commons.

R. BAKERANUS Bart. & Ridd. V.-c. 16. Hayes Common, 1888, in *Fl. Kent,* 112, as R. RHAMNIFOLIUS var. EXILIS. Chislehurst Common in 1923. V.-c. 17. Putney Heath; Wimbledon, Palewell, Ham, Barnes, Tooting and Fairmile Commons.

R. NEMORALIS P. J. Muell. V.-c. 16. Hayes Common; Dartford Heath. V.-c. 17. Wimbledon, Wandsworth and Mitcham Commons. V.-c. 18. Warley Common; Shrub Hill, Warley. V.-c. 21. Hanger Hill, Ealing; Uxbridge Common. V.-c. 24. Black Park; Fulmer Road, Iver Heath, abundant.

var. MICROPHYLLUS (Lindeb.) W. Wats. V.c. 16. Hayes Common, extinct. Not known in the other v.-cc. but it is likely to appear where R. NEMORALIS is found.

R. OXYANCHUS Sudre. V.-c. 17. Putney Heath; St. Ann's Hill. V.-c. 21. Uxbridge Circus.

R. LEUCANDRUS Focke. V.-c. 16. Bickley, as a casual, now extinct. V.-c. 17. Wandsworth Common. (Given for Putney Heath in *Fl. Surrey*, 268, but the plant was R. GRATUS).

R. ORBIFOLIUS Lef. V.-c. 17. Ashtead Forest, several bushes.

R. MACROPHYLLUS W. & N. V.-c. 16. Shooters Hill; Plumstead Common; Bostall Heath; Lesness Wood; Hayes Common; Springpark Wood; Dartford Heath; Well Hill. V.-c. 17. Putney Heath; Wimbledon Common. V.-c. 18. Warley Common; Barracks Wood, Warley. V.-c. 20. Mimmshall and Oxhey Woods; Bricket Wood Common; Prae Wood, St. Albans. V.-c. 21. Arnos Grove; Mimmshall Wood; Park Wood, Ruislip; Bishops Wood, Highgate, 1882 and 1948; Mad Bess and Bayhurst Woods, Ruislip.

R. RAMOSUS Blox. ex Briggs. V.-c. 21. Harrow Weald Common, plentiful.

R. SUBINERMOIDES Druce ex Wats. V.-cc. 16, 17 and 21. Common in woods and on heaths. V.-c. 18. Warley Common; Epping Forest, near the Wake Arms; Kelvedon Hatch; Coxtie Green, abundant. V.-c. 24. Bishops Wood.

× ULMIFOLIUS, fruiting well, occurs in v.-c. 21. Ducks Hill, Northwood, 1890; *Hb. Benbow*. Still there 1948.

R. AMPLIFICATUS Ed. Lees. V.-c. 16. Dartford Heath. V.-c. 18. Epping Forest, Old Road S.E. of Wake Arms; Shrub Hill, Warley. V.-c. 20. Oxhey and Mimmshall Woods. V.-c. 21. Harrow Weald Common; Bayhurst and Mimmshall Woods; Uxbridge Common; Northwood; Arnos Grove; Finchley Common. Between Harmondsworth and Stanwell, *Hb. Benbow*, as R. SCHLECHTENDALII. V.-c. 24. Northmoor Hill Wood, Denham.

R. CRUDELIS W. Wats. V.-c. 17. Putney Heath; Barnes Common.

R. PYRAMIDALIS Kelt. V.-c. 16. Eltham Common; Bostall Heath; Petts Wood; Keston Common; Broomfield Wood, Knockholt; French Street; Hosey Common; Squerryes Park. V.-c. 17. Streatham Common; Addington Hills; Springpark Wood; The Chart and Cronklands, Limpsfield; Limpsfield and Tilburstow Hill Commons; Headley, wood N. of the Church; Banstead Heath; Weybridge Common. V.-c. 18. Epping Forest; Warley Common. V.-c. 21. Horsendon Hill.

var. PARVIFOLIUS Frid. & Gel. V.-c. 16. Hayes, Keston and Hosey Commons. V.-c. 17. The Chart. V.-c. 18. Epping Forest; margin of a wood adjoining Warley Common. V.-c. 21. Hampstead Heath.

R. EGREGIUS Focke. V.-c. 16. Hedge between Broomfield Wood and Knockholt Pound. V.-c. 17. Littleheath Wood, Selsdon. V.-c. 21. Park Wood, Ruislip; Mad Bess Wood, roadside. Bayhurst Wood, 1890, *Hb. Benbow*, as R. BRACTEATUS; roadside between Botany Bay and Enfield, *Hb. Benbow*, as R. SILVATICUS.

× ULMIFOLIUS. V.-c. 21. One bush, Park Wood, Ruislip, near Broadwood Avenue. Erroneously reported as R. DANICUS in *Lond. Nat.*, *26*, 67.

R. ATROCAULIS P. J. Muell. V.-c. 17. Putney Heath; Sheen Common; wood between Weybridge and Walton. V.-c. 18. Tylers Common, Warley; Epping Forest, Broad Strood, Fairmead Bottom, and near Woodford.

R. VILLICAULIS Koehl. V.-c. 16. French Street.

R. LANGEI G. Jens. ex Frid. & Gel. V.-c. 17. Banstead and Walton Heaths.

R. CRYPTADENES Sudre. V.-c. 16. Shooters Hill; Shrewsbury Park; Slade Ravine, Plumstead; Bostall Heath; Hawley's Corner at 775′, Westerham Hill. V.-c. 17. Wimbledon Common.

R. RHOMBIFOLIUS Weihe. V.-c. 16. Hayes Common; Springpark Wood. V.-c. 17. Wimbledon, Barnes, Ham, Palewell and Great Bookham Commons; Reigate Heath. V.-c. 18. Epping Forest, near Woodford, fide *C. Avery*. V.-c. 20. Bricket Wood Common. V.-c. 21. Hounslow Heath; Copse Wood; Swakeleys; Stanmore Common.

R. POLYANTHEMOS Lindeb. V.-c. 16. Chislehurst Common, 1922, now extinct; Petts Wood, appeared 1950. Hayes Common, about 1890, *Crespigny*, now extinct. Plumstead Common and Bostall Heath, about 1890, *W.-Dod*. V.-c. 17. Frequent on the suburban commons, and Great Bookham Common; Fairmile Common; St. Ann's Hill; Headley and Reigate Heaths; Walton and Limpsfield Commons; Addington Hills. V.-c. 18. Epping Forest, in the southern part, and at High Beach and near Loughton; Kelvedon Hatch; Coxtie Green; Warley Green and Shrub Hill, Warley; Hainault Forest. V.-c. 20. Oxhey and Broxbourne Woods; Hertford Heath; Prae Wood, St. Albans. V.-c. 21. Frequent. V.-c. 24. Black Park; Denstead Wood, Denham.

R. ALTERNIFLORUS M. & L. V.-c. 17. Wimbledon and Tooting Commons. V.-c. 21. Horsendon Hill. V.-c. 24. Northmoor Hill Wood, roadside, Denham.

R. SEPARINUS Genev. V.-cc. 16 and 17. Almost everywhere. V.-c. 21. Hampstead and Hounslow Heaths; Swakeleys; Park Wood, Ruislip. V.-c. 24. Near Alderbourne Farm, and near Mount Farm, Denham.

R. MERCIERII Genev. (nomen). V.-c. 16. French Street; Hosey Common.

R. PROLONGATUS Boul. & Let. V.-c. 16. Puddledock. V.-c. 17. Littleheath Wood, Selsdon.

R. ACCLIVITATUM W. Wats. V.-c. 16. Crockham Hill Common West. V.-c. 17. Chertsey, *J. G. Baker*, as R. MACROPHYLLUS.

R. CONSOBRINUS (Sudre) W. Wats. V.-c. 16. Crockham Hill Common West. V.-c. 17. The Chart, Limpsfield, near the Church.

R. LONDINENSIS (Rog.) W. Wats. V.-c. 16. Blackheath; Bostall Heath; Pauls Cray and Hayes Commons. V.-c. 17. Putney Heath; Barnes, Tooting, Ham, Fairmile, Weybridge and Walton Commons; West End Common, Esher; Oxshott Heath; Addington Hills; Spout Hill, Addington; Sandpits Lane, Shirley. V.-c. 21. Hampstead and Hounslow Heaths. V.-c. 24. Fulmer Road, near Pinewood Film Studios.

R. CARDIOPHYLLUS L. & M. Frequent in all the v.-cc. Often accompanies R. CARPINIFOLIUS.

var. FALLAX W. Wats. V.-c. 17. West End Common, Esher.

R. DUMNONIENSIS Bab. V.-c. 17. Springpark Wood. (Given for Reigate Heath in *Fl. Surrey*, 266, but the specimen is R. RHOMBIFOLIUS).

R. ERRABUNDUS W. Wats. V.-c. 17. Tooting Common, destroyed during the last war.

R. ULMIFOLIUS Schott fil. V.-cc. 16 and 17. Common, especially on the chalk and in hedges on clay. Less common in v.-cc. 18, 19, 20, 21 and 24.

× VESTITUS. A fertile hybrid, often plentiful where it occurs, sometimes being called (incorrectly) R. LASIOCLADOS Focke. More or less narrow-leaved, infertile, products of crosses between ULMIFOLIUS and VESTITUS have been called R. LASIOCLADOS var. ANGUSTIFOLIUS Rogers.

R. PSEUDO-BIFRONS (Sudre) Bouv. V.-cc. 16 and 17. Abundant. V.-c. 18. Epping Forest, thicket near the Roebuck Inn, and one bush near Woodford. V.-c. 20. Oxhey Wood. V.-c. 21. Abundant.

R. WINTERI P. J. Muell. V.-c. 17. Tilburstow Hill Common; The Chart, quarry, Limpsfield.

R. CUSPIDIFER M. & L. V.-c. 16. Slade Ravine, Plumstead Common and Shooters Hill, in both places with white flowers. V.-c. 17. Putney Heath.

R. NEOMALACUS Sudre. V.-c. 17. Great Bookham, Fairmile and Claygate Commons.

R. HYLOPHILUS Rip. ex Genev., R. BRITTONII Bart. & Ridd. V.-c. 16. Chislehurst and Hayes Commons; Barnet Wood, Hayes; Farnborough Common. V.-c. 17. Tooting, Mitcham and Weybridge Commons. V.-c. 21. Poor's Field, Ruislip; Ruislip Common and Park Wood, Ruislip; Hounslow Heath; Hanger Hill, Ealing.

R. THYRSANTHUS Focke. V.-c. 16. Hayes Common, near the top of Station Hill.

R. POLIOCLADOS W. Wats. V.-c. 16. Eltham Common, one plant. V.-c. 18. Epping Forest, frequent.

R. LASIOSTACHYS L. & M. V.-c. 16. Chislehurst and Hayes Commons; Barnet Wood, Hayes. V.-c. 17. Frequent. V.-c. 21. Hampstead Heath; Uxbridge to Swakeleys.

R. HYPOMALACUS Focke. V.-cc. 20 and 21. Mimmshall Wood, on the Middlesex-Herts. boundary, in a rather glandular form, with pink flowers, which has been mistaken for R. MUCRONIFER Sudre, and has received the name of R. HANSENII Krause in Schleswick-Holstein.

R. SERRATULIFOLIUS Sudre. V.-c. 17. Watts Hill, The High Chart, Limpsfield.

R. SCHMIDELYANUS var. LONGIGLANDULOSUS Sudre. V.-c. 17. Littleheath Wood, an extensive group of bushes.

R. CONDENSATUS P. J. Muell. V.-c. 21. N. end of Harrow Weald Common.

R. SCIOCHARIS Sudre. V.-c. 16. Crystal Palace Grounds.

R. GREMLII Focke. V.-c. 21. Copse Wood.

R. INOPACATUS M. & L. V.-c. 17. Headley Heath; Fairmile Common. V.-c. 18. Epping Forest, Broad Strood.

R. SILESIACUS Weihe. V.-c. 16. Shrewsbury Park, Plumstead.

R. EIFELIENSIS Wirtg. V.-c. 24. Black Park; Fulmer Common.

R. MACROSTACHYS P. J. Muell. V.-c. 16. Crockham Hill Common at 600′ on the Edenbridge Road.

R. VESTITUS Weihe. The pinkish-flowered form has been found in all the v.-cc.; it occurs indifferently on chalk, clay, gravel or sand. The beautiful red-flowered form has been noted in v.-c. 16. Rowhill and French Street. V.-c. 17. Littleheath Wood. V.-c. 18. Epping Forest. V.-c. 20. Oxhey Wood. V.-c. 21. Hampstead Heath.

R. ANDEGAVENSIS Bouv. V.-c. 16. Hosey Common, roadside E. of the school.

R. LEUCOSTACHYS Smith. V.-c. 16. Shooters Hill; Leesons, Chislehurst; Farnborough Common; Barnet Wood, Hayes; Keston Common at 490′; Skid Hill, three miles west of Cudham; Berry's Green Road; Well Hill; Hollards Wood, Chelsfield; Timberden Bottom; Hosey Common; Squerryes Park. V.-c. 17. Wimbledon and Streatham Commons; Addington Hills; Reigate Heath; Tilburstow Hill and Limpsfield Commons. V.-c. 18. Epping Forest. V.-c. 21. Harrow Weald Common.

R. ADSCITUS Genev. V.-c. 16. Skeet Hill, near road junction at 525′. V.-c. 20. Whippendell Wood, 1950, *W. H. Mills*.

R. MACROTHYRSUS Lange. V.-c. 16. Shooters Hill; Chislehurst, Hayes and Keston Commons; Springpark Wood; Bostall Heath; Darenth and Farningham Woods; near Hawley Street, 750′; Well Hill; Squerryes Park; Hosey Common. V.-c. 17. Addington Hills; Littleheath Wood; Selsdon; St. Ann's Hill; Tilburstow Hill and Limpsfield Commons; The Chart. V.-c. 18. Epping Forest. V.-c. 20. Oxhey and Mimmshall Woods. V.-c. 21. Hampstead Heath; Harrow Weald Common; Mimmshall and Scratch Woods; Hanger Hill, Ealing.

R. CONSPICUUS P. J. Muell. V.-c. 16. Darenth Wood.

R. CONSPERSUS W. Wats. V.-c. 17. Streatham Common. Arbrook Common, *C. E. Britton*, as R. CRINIGER.

R. BOREANUS Genev. V.-c. 16. Squerryes Park; Kent Hatch. V.-c. 17. The Chart, Limpsfield. V.-c. 24. Northmoor Hill Wood, Denham.

R. CRINIGER (E. F. Linton) Rog. V.-c. 16. Shooters Hill; Dothill Road, Plumstead. V.-c. 18. About Pilgrims Hatch and Kelvedon Hatch, fide *C. Avery*. V.-c. 20. Whippendell Wood; Hertford Heath. V.-c. 21. Copse Wood; Mad Bess Wood, roadside; Uxbridge Common.

R. PODOPHYLLUS P. J. Muell. V.-c. 17. Putney Heath; Addington Hills; Ballards Plantation; Littleheath Wood; Springpark Wood.

R. DREJERI Jensen. V.-c. 17. Mitcham and Tilburstow Hill Commons.

R. ATRICHANTHERUS Krause. V.-c. 21. Bayhurst Wood, W. side (as R. MUCRONATUS Blox., Rogers *op. cit.*). V.-c. 24. Black Park, S., N., E. and W. sides; Northmoor Hill Wood, roadside, Denham.

R. CINEROSUS Rog. V.-c. 16. Eltham Common; Dothill Road, and Slade Ravine, Plumstead; Chislehurst Common; Summer Hill, Chislehurst; Hayes Common; Bromley; Holwood Park; Farnborough Common; Lower Pickhurst Green. V.-c. 17. Streatham and Mitcham Commons; Addington Hills; Springpark Wood. V.-c. 20. Oxhey Wood. V.-c. 21. Barn Hill, Wembley.

R. MUCRONATOIDES A. Ley. V.-c. 17. St. Ann's Hill.

R. BADIUS Focke. V.-c. 17. Springpark Wood at 350′, in two places.

R. RADULA Weihe. V.-c. 16. Shooters Hill, 1894, *Hb. W.-Dod.* V.-c. 17. Littleworth Common, Esher; Addington Hills; Putney Heath; Coombe Park Road, Kingston Hill; Epsom Common, S. of the large ponds; The Chart, quarry, Limpsfield. V.-c. 20. Whippendell Wood. V.-c. 21. Harrow Weald Common; Hounslow Heath; Horsendon Hill; near Ruislip Reservoir; Uxbridge Common; Scratch Wood. V.-c. 24. Western border of Northmoor Hill Wood, Denham.

var. MICROPHYLLUS Lindeb. V.-c. 17. Putney Heath; Littleworth Common.

R. PUSTULATUS P. J. Muell. V.-c. 17. Farm Bog, Wimbledon Common, ? extinct.

R. ASPERICAULIS P. J. Muell. V.-c. 16. Shooters Hill; rather frequent on the North Downs between 500′ and 750′; Squerryes Park. V.-c. 17. Putney Heath, by the Portsmouth Road; Limpsfield Common; Littleheath Wood, Selsdon. V.-c. 18. Epping Forest. V.-c. 20. Whippendell Wood. V.-c. 21. Horsendon Hill.

R. SECTIRAMUS W. Wats. V.-c. 16. Shooters Hill; Abbey Wood: Town Court, Petts Wood; Hosey and Keston Commons; Springpark Wood. V.-c. Putney Heath; Wimbledon, Wandsworth, Mitcham, Sheen, Palewell, Tooting and Streatham Commons; Springpark Wood. V.-c. 20. Oxhey Wood, fide *C. Avery*. V.-c. 21. Hampstead Heath, *Rogers*, as R. ANGLICANUS form. Hounslow Heath; Pinner Wood.

R. DISCERPTUS P. J. Muell. V.-c. 16. Rare. Eltham Common; Bostall Heath; Westwood Lane, Welling, about 1927; Hurst; Puddledock; Squerryes Park, against the old water mill. V.-c. 17. Frequent. V.-c. 18. Epping Forest, near Woodford and High Beach; Hainault Forest; about Pilgrims Hatch, Kelvedon Hatch and Coxtie Green, fide *C. Avery*. V.-c. 20. Oxhey Wood; Bishops Wood, near Batchworth Heath; Whippendell Wood; Bricket Wood Common; Kings Langley Common; Prae and Broxbourne Woods. V.-c. 21. Frequent. V.-c. 24. Nightingale Wood, Northmoor Hill, Denham.

R. ECHINATOIDES (Rog.) Druce. V.-c. 16. Gravelpit Lane, Eltham; Eltham Common; Bostall and Dartford Heaths; Chislehurst, Hayes and Keston Commons; Springpark Wood; near Well Hill; Fairtrough, Pratt's Bottom at 475′. V.-c. 17. Tooting Common; Littleheath Wood; Littleworth Common, Esher; near Oxshott Heath. V.-c. 20. Woodcock Hill, margin of the wood near the Inn. Oxhey Wood; Bricket Wood Common; Mimmshall, Prae and Whippendell Woods. V.-c. 21. Uxbridge Common; Mimmshall Wood; Ruislip Reservoir; Mad Bess Wood. V.-c. 24. Blacksmith's Lane, Denham.

R. RUDIS Weihe. V.-c. 16. Springpark Wood; Hayes Common; Barnet Wood, Hayes; Hayes Fields; Petts Wood; Leesons, Chislehurst; Crofton; Pratt's Bottom; very frequent in woods and lanes on the North Downs up to 700′. V.-c. 17. Wimbledon Common; Coombe Wood; Ham Common; Headley Heath; Great Bookham Common; Banstead Heath and Downs; How Green; Littleheath and Kings Woods near Selsdon; near Chelsham; Limpsfield Common, with white flowers. V.-c. 21. Hampstead Heath; Bayhurst and Scratch Woods. V.-c. 24. Northmoor Hill Wood, Denham.

R. PULCHER M. & L. V.-c. 16. Bostall Heath, a small group of bushes near Bostall Lane, still there in 1950.

R. RADULICAULIS Sudre. V.-c. 16. Springpark Wood. V.-c. 17. Springpark Wood; Gee Wood, Selsdon. V.-c. 21. Bayhurst Wood, west side.

R. MICANS Godr. in Gren. & Godr. V.-c. 16. French Street; Squerryes Park, by the footpath going westward from Hosey Hill. V.-c. 17. Tilburstow Hill Common.

R. GRANULATUS M. & L. V.-c. 16. Shooters Hill; Slade Ravine, Plumstead; Hosey Common. V.-c. 17. Near the quarry, The Chart, Limpsfield. V.-c. 20. Whippendell Wood. V.-c. 21. Potter Street, Pinner; Pinner Wood; Swakeleys.

R. RHENANUS P. J. Muell. V.-c. 17. Putney Heath, in a marshy spot.

R. PRIONODONTUS L. & M. V.-c. 16. Pond Wood and Leesons, Chislehurst; Barnet Wood, Hayes; Well Hill, above the Cock Inn; Owen Wood; Hollards Wood, Chelsfield; Timberden Bottom; wood south of Rushmore Hill; woods east and west of Knockholt Pound. V.-c. 24. Bayhurst Wood, east side.

R. FOLIOSUS Weihe. V.-c. 16. Well Hill; Hollards Wood, Chelsfield; Timberden Bottom; above the Terrace Walk, Shoreham, towards Shepherds Barn; Berry's Green Road, Cudham, at 650′; wood behind Polhill Arms. V.-c. 17. Wimbledon Common, *Barton* and *Riddelsdell*, as R. RUBIGINOSUS; Banstead Heath; Ashtead Forest; Limpsfield Common. V.-c. 20. Oxhey and Whippendell Woods; Baldwin's Lane, Croxted Green. V.-c. 21. Park Wood, Ruislip; Uxbridge Circus; Mad Bess and Copse Woods, Northwood. V.-c. 24. Northmoor Hill Wood, Denham.

R. EXSOLUTUS L. & M. V.-c. 16. Old Park Wood, Bostall Heath. V.-c. 20. Woodcock Hill, margin of the wood near the Inn.

R. FLEXUOSUS M. & L. Rather frequent in all the v.-cc. on siliceous heaths, especially under furze and in *Castanea* plantations.

R. CORYMBOSUS P. J. Muell. V.-c. 16. French Street; Squerryes Park.

R. HOMALODONTUS (OMALODONTUS) Muell. & Wirtg. V.-c. 18. Epping Forest, north of Robin Hood Inn.

R. ACUTIPETALUS L. & M. V.-c. 16. Near Knockholt Pound; near Shepherds Barn; Hosey Common; Squerryes Park; Crockham Hill Common West. V.-c. 17. Tooting, Petersham and Tilburstow Hill Commons; The Chart, Limpsfield, with white flowers; Addington Hills. V.-c. 21. Mad Bess Wood; Ruislip Common, with white flowers. V.-c. 24. Black Park, south side; western border of Northmoor Hill Wood, Denham.

R. DRYMOPHILUS M. & L. V.-c. 16. Shooters Hill. V.-c. 20. Oxhey Wood. Whippendell Wood, 1950, *W. H. Mills.* V.-c. 21. Hampstead Heath; Hanger Hill; Horsendon Hill; Park Wood, Ruislip. V.-c. 24. Black Park, near the Crooked Billet Inn.

R. FUSCUS Weihe. V.-c. 16. Shooters Hill; Squerryes Park; Hosey Common. V.-c. 17. Putney Heath; Wimbledon Common; The Chart, near the quarry, Limpsfield; Coombe Park Road, Kingston Hill.

R. BLOXAMII Ed. Lees. V.-c. 16. Shooters Hill. V.-c. 21. Old Park Wood, Harefield, 1889, *Hb. Benbow*; 1948, *W. Watson.*

R. CHLOROCAULON (Sudre) W. Wats. V.-c. 16. Squerryes Park. V.-c. 17. The Chart, Limpsfield; Limpsfield Common.

R. ADAMSII Sudre. V.-c. 18. Epping Forest, Woodridden Hill. V.-c. 20. Hertford Heath. V.-c. 21. East of Harefield Park; Park and Mad Bess Woods. Copse below Uxbridge Common, 1890, *Hb. Benbow*, as R. BABINGTONII f. UMBROSA.

R. APICULATIFORMIS Sudre. V.-c. 16. Shooters Hill, below Jack Wood House.

R. TERETIUSCULUS Kalt. V.-c. 21. Outside the N.E. end of Copse Wood, Ruislip.

R. PALLIDUS Weihe. V.-c. 16. Shooters Hill; Owens Wood, Well Hill; near Knockholt Pound; Anisbirches Wood, 650′. V.-c. 20. Redlands Wood, Congsley Grove; Oxhey Wood, fide *C. Avery*. V.-c. 21. Park Wood, Ruislip. Copse below Uxbridge Common, 1884, 1898 and 1902, *Hb. Benbow*, seen there by *W. Watson* and *C. Avery*, 1947-48. Bayhurst Wood, 1889, *Hb. Benbow*. V.-c. 24. Newstead Wood, Denham, abundant.

R. EURYANTHEMUS W. Wats. V.-c. 16. Shooters Hill; Bostall Heath; Pauls Cray, Chislehurst, Farnborough and Hayes Commons; Springpark Wood; Row Hill; Well Hill; Hosey Common. V.-c. 17. Addington Hills; The Chart, Limpsfield, quarry. V.-c. 18. Hainault Forest. V.-c. 19. Abundant in Lower Epping Forest. V.-c. 21. Hampstead Heath; Park Wood, Ruislip; Pinner Hill; Hadley and Scratch Woods.

R. LOEHRI Wirtg. V.-c. 16. Eltham Common; Shooters Hill.

R. ERUBESCENS Wirtg. V.-c. 16. Shooters Hill, Shepherdleas Wood, south of the railway, close to the railings.

R. INSECTIFOLIUS L. & M. V.-c. 16. Widespread and abundant. V.-c. 17. Putney Heath; Great Bookham, Fairmile and Epsom Commons; Burgh and Oxshott Heaths. V.-c. 18. Epping Forest, near Woodford; Warley Common; Shrub Hill, Warley; Barracks Wood, Warley; about Pilgrims Hatch, Kelvedon Hatch and Coxtie Green, fide *C. Avery*. V.-c. 21. Abundant between Uxbridge Common and Swakeleys.

R. FOLIOLATUS M. & L. V.-c. 16. Squerryes Park; Crockham Hill Common West. V.-c. 17. Abundant at the roadside, and in the wood, between Kent Hatch and The Chart, Limpsfield.

R. LARGIFICUS W. Wats. V.-c. 16. Hayes Common; Holwood Park; Keston Common; Bickley; Anisbirches Wood, 650′; Well Hill; Skeet Hill; Squerryes Park; French Street. V.-c. 17. Addington Hills; Ballards Plantation; Springpark Wood; Frith Wood, Farleigh; Worms Heath; Chaldon; Walton Heath, eastern margins; Tilburstow Hill Common; The Chart, Limpsfield; Limpsfield Common.

R. GLAREOSUS Marsh. ex Rog. V.-c. 16. Eltham, Keston and Hayes Commons; Skeet Hill; Shooters Hill; west of Shoreham; Anisbirches Wood, 650′; Hosey Common; French Street; Squerryes Park; Crockham Hill Common West. V.-c. 17. The High Chart; St. Ann's Hill. V.-c. 21. Hampstead Heath. V.-c. 24. Denham.

R. ACIDOPHYLLUS (ACIPHYLLUS) Sudre. V.-c. 16. Squerryes Park.

R. FUSCIFORMIS Sudre. V.-c. 16. Squerryes Park. V.-c. 17. The Chart, Limpsfield. Coombe Park, near Wimbledon Common; *C. Avery.*

R. LINTONI Focke ex Bab. V.-c. 20. Whippendell Wood.

R. CYCLOPHORUS (Sudre) W. Wats. V.-c. 16. Shooters Hill; Lesness Wood; Bexley Wood.

R. SCABER Weihe. V.-c. 16. Springpark Wood; Squerryes Park. V.-c. 17. Top of Sydenham Hill; Streatham Common. V.-c. 20. Whippendell Wood. Northaw Great Wood, near Potters Bar. V.-c. 21. Copse, Mad Bess and Park Woods, Ruislip. V.-c. 24. Newstead Wood, Denham.

× ULMIFOLIUS. V.-c. 24. Newstead Wood, Denham, one clump fertile.

R. DERASIFOLIUS (Sudre) W. Wats. V.-c. 16. Shooters Hill; Springpark Wood. V.-c. 17. Springpark Wood. V.-c. 24. Northmoor Hill Wood, Denham.

R. MICRODONTUS M. & L. V.-c. 16. Row Hill; Dartford Heath; Hosey Common; Squerryes Park. V.-c. 21. Stanmore Common. Top Wood, N. of Harefield, 1899, *Hb. Benbow*, as R. SCABER. V.-c. 24. Denham.

R. CONCOLOR W. Ley. V.-c. 16. Shooters Hill, Oxleas Wood.

R. VALLISPARSUS Sudre. V.-c. 16. Shooters Hill, frequent.

R. PRAETEXTUS Sudre. V.-c. 16. Hosey Common.

R. THYRSIFLORUS Weihe. V.-c. 21. Scratch Wood, and south of it, abundantly.

R. LONGITHYRSIGER Ed. Lees ex Bab. V.-c. 16. Shooters Hill, abundantly; Bexley Wood; Hayes Common. V.-c. 17. Tilburstow Hill Common.

R. TRUNCIFOLIUS M. & L. V.-c. 16. Gravelpit Lane, Eltham, on the west side, in the cutting.

R. OBCUNEATUS L. & M. V.-c. 16. Gravelpit Lane, Eltham; Shooters Hill, frequent.

R. OBSCURUS Kalt. V.-c. 16. Shooters Hill, W. of the Tea Pavilion. V.-c. 17. St. Ann's Hill.

R. OBSCURIFORMIS Muell. & Wirtg. V.-c. 16. Shooters Hill, above the Tea Pavilion.

R. CRUENTATUS P. J. Muell. V.-c. 18. Epping Forest, Broad Strood, valley below Great Monks Wood, and N. of the Robin Hood Inn.

R. ENTOMODONTOS P. J. Muell. V.-c. 16. Squerryes Park, Crockham Hill Common East. V.-c. 17. Tilburstow Hill Common; Frith Wood, Farley.

R. OBSCURISSIMUS Sudre. V.-c. 16. Barnet Wood Lane, Hayes. V.-c. 17. Littleheath Wood, Selsdon.

R. INSERICATUS P. J. Muell. V.-c. 16. Shooters Hill, frequent.

R. RHOMBOPHYLLUS Muell. & Wirtg. V.-c. 16. Eltham Common, at 250′.

R. GRAVETII (Boul. ex Sudre) W. Wats. V.-c. 18. Epping Forest, scattered about High Beach.

R. ADORNATIFORMIS (Sudre) Bouv. V.-c. 16. Hosey Common, frequent; Squerryes Park. V.-c. 17. Springpark Wood.

R. RUFESCENS L. & M. V.-cc. 16 and 17. Frequent. V.-c. 18. Apparently rare. Epping Forest, near the Robin Hood Inn. V.-cc. 20 and 21. Frequent. V.-c. 24. Black Park; Denstead Wood, Denham.

R. GRYPOACANTHUS L. & M. V.-c. 16. Squerryes Park. V.-c. 17. The Chart, quarry, Limpsfield.

R. SPRENGELIIFLORUS Sudre. V.-c. 16. Springpark Wood.

R. TAENIARUM Lindeb., R. SPURIUS Neum. V.-c. 17. The Chart, quarry, Limpsfield. V.-c. 18. Epping Forest, the Warren, Buckhurst Hill, 1887, *Hb. J. T. Powell* as *R. sertiflorus* det. *C. C. Babington.*

R. AHENIFOLIUS W. Wats. V.-c. 17. Putney Heath.

R. APICULATUS Weihe. V.-c. 16. Springpark Wood. Shooters Hill, 1892, *Hb. W.-Dod.* V.-c. 17. Wimbledon Common, on both sides of the Beverley Brook; Great Bookham Common; The Chart, quarry, Limpsfield; Ballards Plantation, south of a large Sycamore; Springpark Wood. V.-c. 21. Northwood, 1932.

R. HETEROBELUS Sudre. V.-c. 16. Keston Common; Crockham Hill Common. V.-c. 17. Springpark Wood. V.-c. 18. Epping Forest, near High Beach, one bush, 1943. V.-c. 20. Oxhey Wood.

R. TARDUS W. Wats. V.-c. 16. Springpark Wood; Hayes and Farnborough Commons; Lower Pickhurst Green; between Bromley and Pickhurst Mead; Bostall Heath. V.-c. 17. Springpark Wood; Putney Heath; Tooting and Mitcham Commons; Addington Hills; Littleheath Wood, Selsdon.

R. MELANOXYLON Muell. & Wirtg. V.-c. 16. Hayes Common. V.-c. 17. Springpark Wood. V.-c. 21. Copse Wood.

R. MELANODERMIS Focke. V.-c. 16. Hayes Common; Beaumont Wood at 625′; Buckhurst Road, at 750′. V.-c. 17. Putney Heath; Wimbledon Common; Champions and The Chart, quarry, near Limpsfield; Tilburstow Hill Common.

R. VECTENSIS W. Wats. V.-c. 17. Tooting Common, close to the shore of the lake, extinct.

R. PHAEOCARPUS W. Wats. V.-c. 16. Chislehurst, Farnborough and Hayes Commons; Barnet Wood, Hayes; Shooters Hill; Dartford Heath; Squerryes Park. V.-c. 17. Putney Heath; Wimbledon, Wandsworth, Weybridge and Streatham Commons; Littleheath Wood, Selsdon.. V.-c. 18. Epping Forest, one bush near Woodford, fide *C. Avery.* V.-c. 21. Near Swakeleys.

R. INDUSIATUS Focke. V.-c. 16. Dothill Road and Garland Road, Plumstead; Row Hill. V.-c. 17. Little Heath, Limpsfield.

R. MOYLEI Bart. & Ridd. V.-c. 16. Gravelpit Lane, Eltham. V.-c. 17. Coombe Wood; Wandsworth, Fairmile and Weybridge Commons; Walton Heath; St Ann's Hill.

R. FURVICOLOR Focke. V.-c. 17. The Chart, quarry, Limpsfield.

R. HOSTILIS Muell. & Wirtg. V.-c. 17. Tooting Graveney Common, one bush, destroyed in levelling. V.-c. 20. Oxhey and Bishops Woods. V.-c. 21. Frequent. Harrow Weald Common; hedge west of Ruislip Lido; Stanmore Common; near Swakeleys; Potter Street, Pinner. Pinner Wood, 1889, *Hb. Benbow*, as R. HYSTRIX, det. *J. G. Baker*, as R. ROSACEUS var. INFECUNDUS, det. *Rogers.* Scratch, Copse and Mad Bess Woods; Ruislip Common. V.-c. 24. Denham; Black Park; Alderbourne Farm.

× ULMIFOLIUS. Fertile. V.-c. 21. Mad Bess Wood, roadside, in two spots.

R. DIVERSUS W. Wats. V.-c. 16. Shooters Hill, frequent; Lesness Wood. V.-c. 17. Frith Wood, Farley. V.-c. 21. Hadley Wood.

R. LEIGHTONI Ed. Lees ex Leight. V.-c. 17. Barnes Common. V.-c. 18. Epping Plain, and near Coopersale Common, 1950, *C. Avery.*

R. ROSACEUS Weihe. V.-c. 16. Lesness Wood; East Wickham; Chislehurst, Hayes and Keston Commons; Nash; Springpark Wood; Well Hill; Buckhurst Road, near Shepherd's Barn; general in woods on the North Downs; Squerryes Park; Hosey Common. V.-c. 17. Putney Heath; Frith Wood, Farley; Lady Grove, Selsdon; Kings and Littleheath Woods, Selsdon; How Green; Little Heath; Limpsfield; Westerham Road from Limpsfield Common to Moorhouse Bank, abundant; Limpsfield and Tilburstow Hill Commons. V.-c. 18. Epping Forest, Leppitts Hill, and between the Wake Arms and Robin Hood Inns; Snaresbrook, 1891, *Hb. J. T. Powell*, as R. EMERSISTYLUS P. J. Muell., det. *C. C. Babington*. V.-c. 20. Whippendell Wood. V.-c. 21. Perivale Wood, *Hb. Benbow*. Lane between Wood End and Harrow, *Hb. Benbow*, as R. VIRIDIS, det. *Rogers*. Hampstead Heath; Horsendon Hill, abundant; Park Wood, Ruislip. V.-c. 24. Black Park.

R. POWELLII Rog. V.-c. 18. Not known outside of Epping Forest.

R. FORMIDABILIS L. & M. V.-c. 17. Frequent. Putney Heath; Wimbledon Common; Coombe Wood; Littleworth Common, Esher; Arbrook, Great Bookham, Fairmile, Weybridge and Walton Commons; West End Common, Esher; Ashtead Forest.

R. SQUALIDUS Genev., R. MUTABILIS Genev. var. NALDRETTI J. W. White. V.-c. 16. Beckenham, 1892, *Crespigny*, as R. DUMETORUM det. *Rogers*. Well Hill; Hosey Common; Crockham Hill Common West.

R. BILLOTII P. J. Muell. V.-c. 16. Shooters Hill, Shepherdsleas Wood, a small form; Crockham Hill Common West, at 575′, in the wood a little W. of the Edenbridge Road. V.-c. 17. Frith Wood, Farley, abundant; wood S. of Farley Court; Littleheath and Kings Woods, Selsdon.

R. ROTUNDIFOLIUS (Bab.) Blox. in Kirby, R. HIERNII Ridd. V.-c. 17. Weybridge and Tilburstow Hill Commons.

R. HYSTRIX Weihe. V.-c. 16. Shooters Hill; Hosey Common. V.-c. 17. The Chart, quarry and Watts Hill, Limpsfield; Tilburstow Hill Common. V.-c. 21. Park Wood, Ruislip (Broadwood Avenue).

R. HYLOCHARIS W. Wats. V.-c. 16. N. of Old Park Wood, Bostall Heath. V.-c. 21. Hampstead Heath; Ken Wood.

R. MARSHALLI Focke & Rog. V.-c. 16. N. of Old Park Wood, Bostall Heath; Hosey Common; Squerryes Park. V.-c. 17. Champions Cottages, The Chart, Limpsfield. V.-c. 21. Near Swakeleys.

R. FUSCO-ATER Weihe. V.-c. 17. Walton Heath, on the western margin of the Golf Course. V.-c. 21. Hampstead Heath, 1946 and 1950.

R. HORRIPILUS L. & M. V.-c. 21. Park Wood, Ruislip, near Broadwood Avenue, 1937, as R. SPLENDIDUS.

R. OEGOCLADUS (OIGOCLADUS) M. & L. V.-c. 16. Shooters Hill; French Street to Crockham Hill. V.-c. 21. Park Wood, Ruislip, near Broadwood Avenue. V.-c. 24. Great Halings Wood, in a private road, Denham.

R. ABSCONDITUS L. & M. V.-c. 16. Squerryes Park, frequent. V.-c. 17. The Chart and Watts Hill, Limpsfield; Limpsfield Common; Littleheath Wood, Selsdon. V.-c. 24. Langley Park, near the Slough road.

R. EXASPERATUS L. & M. V.-c. 16. Crockham Hill Common West, in the disused pit.

R. BAVARICUS (Focke) **comb. nov.** V.-c. 17. Springpark Wood.

R. ADORNATUS Muell. in Wirtg. V.-c. 21. Park and Copse Woods, Ruislip.

R. DASYPHYLLUS Rog. Rather frequent in hedgerows and by footpaths in all the v.cc.

R. HUMIFUSUS Weihe. V.-c. 16. Eltham Common, near the top at about 375′.

R. INFESTUS Weihe. V.-c. 16. Farnborough and Hayes Commons; Barnet Wood, Hayes. V.-c. 17. Putney Heath; Walton and Weybridge Commons; St. Ann's Hill. V.-c. 21. Hounslow Heath. V.-c. 24. Northmoor Hill Wood.

R. NEWBRIDGENSIS Bart. & Ridd. V.-c. 16. Frequent in woods on the upper parts of the North Downs, e.g. between 560′ and 625′ around Polhill, Knockholt and Rushmore Hill; Darenth Wood. V.-c. 17. Tilburstow Hill Common; woods on the Downs around Chaldon; Selsdon Wood.

R. SPINULIFER Muell. & Wirtg. V.-c. 16. Bostall Heath; Bexley Wood. V.-c. 17. Caesar's Camp, Wimbledon Common; Ditton Marsh. V.-c. 21. Brabsden Green, 1932; Horsendon and Hanger Hills.

× ULMIFOLIUS. Fertile. V.-c. 21. Hanger Hill.

R. PYGMAEOPSIS Focke. V.-c. 16. Shooters Hill; Hollards Wood, Chelsfield; Squerryes Park; Hosey Common. V.-c. 17. Epsom Common; The Chart, Limpsfield; Littleheath Wood, Selsdon; Kings, Lady Grove and Court Woods, Selsdon; Stoke Wood, Oxshott. V.-c. 18. Epping Forest, between the Wake Arms and Robin Hood Inns. V.-c. 20. Whippendell Wood. V.-c. 21. Park Wood, Ruislip, opposite 12, Broadwood Avenue.

R. APRICUS var. SPARSIPILUS W. Wats. V.-c. 16. Eltham and Chislehurst Commons; Springpark Wood; Bostall Heath. V.-c. 17. By the Beverley Brook, Wimbledon Common; Mitcham Common; Reigate Heath; Littleheath Wood, Selsdon; Champions Cottages, The Chart, Limpsfield. V.-c. 20. Mimmshall Wood; Bernard Heath, near St. Albans. V.-c. 21. Mimmshall and Scratch Woods; Park Wood, Ruislip.

R. MURRAYI Sudre. V.-c. 16. Shooters Hill; Keston and Hayes Commons; Joyden's Wood; Squerryes Park. V.-c. 17. Putney Heath; Tooting and Streatham Commons. V.-c. 18. Epping Forest, near Loughton. V.-c. 20. Whippendell Wood. V.-c. 21. Hampstead and Hounslow Heaths; Scratch Wood. V.-c. 24. Black Park; Blacksmith's Lane, Denham.

R. CORONATUS var. CINERASCENS W. Wats. V.-c. 17. Putney Heath, towards Roehampton. V.-c. 21. Ducks Hill, Northwood, *Hb. Benbow*, as R. ADORNATUS f., det. *Rogers*.

R. SPINULATUS Boul. V.-c. 16. Shooters Hill; Lesness and Bexley Woods; Churchfield Wood, Bexley.

R. ADENOLOBUS W. Wats. V.-c. 16. Hayes Common. V.-c. 17. Coombe Wood; Palewell, Tooting and Tilburstow Hill Commons. V.-c. 18. Epping Forest, Golding's Hill, and the Lower Forest, S. of the Chelmsford Road; Hainault Forest. V.-c. 20. Oxhey, Whippendell and Bishops Woods. V.-c. 21. Harrow Weald Common; near Ruislip Reservoir; Park Wood, Ruislip; Bayhurst, Copse and Mad Bess Woods. V.-c. 24. Black Park, *Hb. Benbow*, as R. FUSCUS.

R. ASPERIDENS Sudre in Bouv. V.-c. 16. Shooters Hill; Springpark Wood; Squerryes Park, frequent. V.-c. 17. Springpark Wood; The Chart, Limpsfield.

R. HORRIDICAULIS P. J. Muell. V.-c. 16. Squerryes Park. V.-c. 17. The Chart, Limpsfield.

R. SAXICOLUS P. J. Muell. V.-c. 17. Wimbledon Common, at the northern end of Queensmere.

R. SCHLEICHERI Weihe. V.-c. 17. The Chart, Limpsfield, near the eastern end of the quarry.

R. VIRIDIS Kalt. V.-c. 17. Mitcham Common. V.-c. 24. Black Park; Parkspring Wood.

R. ANGUSTIFRONS Sudre. V.-c. 17. Stag Ride, Wimbledon Common. V.-c. 24. Black Park.

R. HYLONOMUS L. & M. V.-c. 16. Gravelpit Lane, Eltham; Shooters Hill; Hosey Common.

R. HIRTUS Waldst. & Kit. V.-c. 17. Springpark Wood; wood at Telegraph Hill, Claygate. Roadside near Shirley, 1892, *Hb. Crespigny*. V.-c. 21. Horsendon Hill, abundant (in *Hb. S.L.B.I.* legit *E. Lees*, 1848 as R. LEJEUNEI, det. *Rogers* as R. THYRSIGER; in *Hb. Benbow*, 1899, as R. SCABER); Brabsden Green, 1932. V.-c. 24. Black Park, *Hb. Benbow*.

R. GUENTHERI Weihe. V.-c. 21. Copse and Mad Bess Woods.

R. PURPURATUS Sudre. V.-c. 16. Near the top of Eltham Common, side by side with R. LOEHRI and R. HUMIFUSUS; Jack Wood, Shooters Hill, above the Tea Pavilion, in profusion. V.-c. 24. Black Park, near the Pinewood Film Studios.

R. BALFOURIANUS Blox. ex Bab. V.-c. 16. Shooters Hill; Petts Wood; Holwood Park; Hayes Common; Springpark Wood; Well Hill. V.-c. 17. Putney Heath; Wandsworth, Mitcham, Fairmile, Walton, Weybridge, Tilburstow Hill and Limpsfield Commons; Headley Heath; Pain's Hill, Limpsfield; Littleheath Wood, Selsdon. V.-c. 18. Warley Green; Coxtie Green. V.-c. 21 Uxbridge Common; Hanger Hill; Hounslow Heath. V.-c. 24. Alderbourne Farm.

R. UMBELLIFORMIS M. & L. V.-c. 16. Shooters Hill, frequent; Gravelpit Lane, Eltham.

R. WARRENII Sudre. V.-c. 16. Eltham Common; Slade Ravine, Plumstead Common. V.-c. 17. Weybridge Common. V.-c. 21. Potter Street, Pinner; Pinner Wood; Copse and Bayhurst Woods; Finchley Common.

R. SUBLUSTRIS Ed. Lees. V.-c. 16. Chislehurst and Hayes Commons; Chelsfield. V.-c. 17. Wimbledon, Tooting, Barnes and Ham Commons; Addington Hills; Limpsfield Common; Banstead Downs; St. Ann's Hill; Reigate Heath. V.-c. 18. Epping Forest. V.-c. 20. Bricket Wood Common; Bishops Wood, Batchworth Heath. V.-c. 21. Hampstead and Hounslow Heaths; Swakeleys; Copse Wood. V.-c. 24. Black Park.

R. CONJUNGENS (Bab.) W. Wats. V.-c. 16. Hayes Common; Dartford Heath; Puddledock. V.-c. 17. Putney Heath; Barnes Common; Walton Heath; Great Bookham and Fairmile Commons; Banstead and Reigate Heaths; Ashtead Forest. V.-c. 18. Epping Forest, Wake Valley Pond; Hainault Forest. V.-c. 20. Woodcock Hill, margin of the wood near the Inn. Oxhey Wood; Croxted Green; Bricket Wood Common; Prae Wood, St. Albans. V.-c. 21. Pinner Hill and Wood; near Ruislip Reservoir; Horsendon Hill; Finchley Common.

R. PURPUREICAULIS W. Wats. V.-c. 21. Long Lane, Ickenham, 1888, *Hb. Benbow,* as R. BLOXAMII, det. *J. G. Baker,* as "*a corylifolius form*", det. *Rogers.* Finchley Common.

R. RADULIFORMIS (A. Ley) W. Wats. V.-c. 16. Very common throughout North-west Kent, especially below 300′. V.-c. 17. Wimbledon, Tilburstow Hill and Epsom Commons; Banstead Downs; The Chart, Limpsfield. V.-c. 18. By pond at Goldings Hill. V.-c. 21. Hampstead Heath; Northwood; near Ruislip Reservoir.

R. ADENOLEUCUS Chab. V.-c. 17. West End Common, Esher; The Chart, quarry, Limpsfield, and Watts Hill. V.-c. 21. Scratch Wood; Apex Corner, near Edgwarebury; Park Wood, Ruislip; Finchley Common.

R. BABINGTONIANUS W. Wats. V.-c. 16. Keston Common; Well Hill; Berry's Green Road, Cudham; Morants Court Hill; around Westerham, e.g. in a pasture near the N.E. angle of the churchyard; Squerryes Park. V.-c. 17. Springpark Wood; Headley Heath; Tilburstow Hill Common; Limpsfield Common; roadside near Ballard's Farm; Littleheath Wood, Selsdon. V.-c. 21. North End, Hampstead Heath, by an old crab S. of the school.

R. TUBERCULATUS Bab. V.-c. 16. Chislehurst and Hayes Commons. V.-c. 17. Palewell and Streatham Commons; Ballards Plantation, and roadside near. V.-c. 18. Epping Forest, Almshouse Plain. V.-c. 20. Whippendell and Broxbourne Woods. V.-c. 21. Harrow Weald Common; about Pinner; Arnos Grove; Northwood; Mimmshall Wood; Park Wood, Ruislip; Scratch Wood.

R. MYRIACANTHUS Focke. V.-c. 16. Berry's Green Road, Cudham, roadside in a valley at 650′. V.-c. 17. Banstead Heath. V.-c. 20. Mimmshall Wood. V.-c. 21. Arnos Grove; Apex Corner, and thence abundantly to Scratch Wood; Stanmore and Finchley Commons; Jacket's Lane, Ducks Hill, Northwood; Mimmshall Wood.

R. SCABROSUS P. J. Muell. V.-c. 16. Chislehurst and Farnborough Commons; Dartford Heath. V.-c. 17. Mitcham and Epsom Commons; Addington Hills; Headley and Reigate Heaths; Banstead Downs; Ballard's Plantation. V.-c. 18. Epping Forest. V.-c. 21. Harrow Weald Common; Hampstead Heath; near Ruislip Reservoir; Copse Wood.

R. BRITANNICUS Rog. V.-c. 16. Chislehurst and Keston Commons; Holwood Park; Well Hill; Buckhurst Road at 725′; Squerryes Park. V.-c. 17. Great Bookham and Wandsworth Commons. V.-c. 18. Barracks Wood, Warley; Hainault Forest; Pilgrims Hatch, Kelvedon Hatch and Coxtie Green. V.-c. 19. Epping Lower Forest. V.-c. 20. Oxhey and Broxbourne Woods; Bricket Wood Common; Woodcock Hill, margin of the wood near the Inn; Mimmshall Wood. V.-c. 21. Harrow Weald Common; about Pinner; Arnos Grove; Northwood; Park Wood, Ruislip; Mimmshall and Scratch Woods.

The following identifications for V.-c. 21. (Middlesex) in *Lond. Nat.*, *26*, 66-73 (1947), have been found to be erroneous and have been corrected:—R. DANICUS, ATROCAULIS, SPLENDIDUS, MUCRONATOIDES, HYPOSERICEUS and EUANTHINUS.

APPENDIX.

The following names occurring in the foregoing account require to be added to the last published list of British Rubi (*Journ. Ecol.*, *33*, 337-44 (1946)):—

ammobius Focke, *Syn. R.G.*, p. 118.
alterniflorus M. & L., Versuch, p. 160, in *Pollichia*, 1859.
Mercierii Genev. (quoad nomen, sed non descript.), *Essai*, p. 271.
conspicuus P. J. Muell. in *Flora* (1858) Zusatze und Berichtigungen.
Gremlii Focke, *Syn. R.G.*, p. 266.
inopacatus M. & L., Versuch., p. 117, in *Pollichia*, 1859.
atrichantherus Krause in Prahl *Kritische Flora Schleswig-Holstein*, II Teil (1890), p. 61.
badius Focke, *Syn. R.G.*, p. 276.
pustulatus (P. J. Muell. ex Sudre, *Bat. Eur.*, p. 11), **comb. nov.** W. Watson.
exsolutus L. & M., Versuch., p. 241, in *Pollichia*, 1859.
apiculatiformis Sudre, *Diagnoses*, p. 35.
teretiusculus Kalt., *Fl. Aachen* (1845), p. 282.
erubescens Wirtgen, *Hb. Rub. Rhen.*, ed. 1, n. 93.
derasifolius (Sudre, *Diagnoses*, p. 55, as ssp. of R. tereticaulis P. J. Muell.) **comb. nov.** W. Watson.
concolor W. Ley in Rabenhorst, *Bot. Centralblatt.* (1846), p. 434
truncifolius M. & L., Versuch., p. 139, in *Pollichia*, 1859.
obcuneatus L. & M., Versuch., p. 196, in *Pollichia*, 1859.
obscuriformis Sudre, *Rub. Eur.*, p. 158, *Bat. Eur.*, n. 510.
grypoacanthus L. & M., Versuch., p. 133, in *Pollichia*, 1859.
sprengeliiflorus Sudre, *Diagnoses*, p. 41.
indusiatus Focke, *Syn. R.G.*, p. 284.
Billotii P. J. Muell., *Bonplandia* (1861), p. 283.
horripilus L. & M., Versuch., p. 126, in *Pollichia*, 1859.
oegocladus M. & L., Versuch., p. 134, in *Pollichia*, 1859.
exasperatus L. & M., Versuch., p. 149, in *Pollichia*, 1859.
bavaricus (Focke, as ssp. of R. Koehleri W. & N., *Syn. Rubi Germ.* (1877), p. 357), **comb. nov.** W. Watson.
asperidens Sudre in Bouvet, *Rub. Anjou*, p. 158.
horridicaulis P. J. Muell., *Bonplandia* (1861), p. 284.
saxicolus P. J. Muell., Versuch., p. 202, in *Pollichia*, 1859.
Guentheri Weihe. See W. & N., *Rubi Germ.*, p. 65.
purpuratus Sudre, *Rub. Pyr.*, p. 82.

The following changes of name have been made, and as they appear here for the first time some explanation is furnished.

R. squalidus Genev. in *Mem. Soc. Acad. Maine-et-Loire*, t. x, p. 20, antedates R. Naldretti (J. W. White) W. Wats., and must therefore take its place.

For the same reason R. hylophilus Rip. ex Genev., *Monog. Rubus* (1880), p. 238, must supersede R. Brittonii Bart. & Ridd. (1931).

For the same reason again R. TAENIARUM Lindeb., *Novit. Fl. Suec.* (1858), p. 5 (descr. and fig.), replaces R. SPURIUS L. M. Neuman in *Bot. Notiser* (1915), p. 85.

In all three cases I have seen the earlier author's specimen, and have studied his original description in the publication cited, and in the third case, in addition, the excellent drawing by Lindeberg.

R. OBCUNEATUS L. & M. (1859) is an earlier name than R. BOTRYEROS (Focke ex Rog.) Focke, which itself replaced R. LEJEUNEI Briggs, *Fl. Plymouth*, 126. The plant issued under No. 92 from Dinmore Woods, Herefordshire, in the set of British Rubi under the name of R. OIGOCLADOS M. & L. (No. 64 in Rogers's *Handbook*) is R. OBCUNEATUS L. & M. I have seen R. OBCUNEATUS growing in S. Devon, and have also seen Lefevre's specimen of R. OBCUNEATUS and Briggs's specimen of his R. LEJEUNEI from S. Devon.

R. DREJERI G. Jensen in *Flora Danica*, t. 3023 (1883), has been reintroduced to stand for the true plant, not for that collected by R. P. Murray at Dunster, Somerset—wholly in fruit in September and therefore difficult to recognise—which Gelert, shortly after having issued the true plant in *Rubi exsiccati Daniae et Slesvigiae*, identified for Murray as R. DREJERI G. Jensen. His identification was accepted by Murray and endorsed by Rogers: I own to having made the same mistake. There is a forma HETERACANTHA F. & G. of R. DREJERI, and no doubt this opened the door to the confusion. Murray's plant however is certainly the same as No. 92, R. HIRTUS var. ROTUNDIFOLIUS Bab. in Rogers's *Handbook*, and the name R. ROTUNDIFOLIUS Bloxam accordingly belongs to that plant and not to the true R. DREJERI, to which I transferred it. The occurrence of both plants at Tilburstow Hill Common has enabled the matter to be cleared up.

In Rogers's *Handbook of British Rubi*, p. 84, there is a record of R. INSOLATUS auctt. (as "Auct.") having been found on Shooters Hill, W. Kent, by A. H. Wolley-Dod. The specimen in *Hb. Wolley-Dod* is labelled "RUBUS INSOLATUS auctt., non P.J.M. (Mueller) nec Genev., teste Focke. Stamens longer than the pink styles, Crown Woods, Shooters Hill, 1893." In my opinion it is unquestionably R. GLAREOSUS Marshall ex Rogers, a bramble which is still found in Oxleas Woods (=Crown Woods) and elsewhere on Shooters Hill.

R. CONCOLOR W. Ley in Oxleas Wood is of particular interest. It was discovered by Wilhelm Ley, an apothecary of Eupen, just before 1846. Focke failed to find it at Eupen in 1876, and Thomas Braeucker who described it in 1882 says it had by then disappeared at Eupen. It has not been reported elsewhere on the Continent. It grows in some quantity in Oxleas Wood, and I have also collected it near Canterbury in East Kent. Ley's description is in Rabenhorst, *Bot. Centralblatt*, 1846, p. 434, and translated is as follows:—

R. CONCOLOR W. Ley Stem patent-branched, green, $\frac{1}{3}$-$\frac{1}{2}$" thick, round below, angled above, with flat sides, very numerous, small thick-based, declining and recurved greenish-yellow prickles, scattered short hairs, quite inconspicuous glands and scarcely noticeable acicles. Leaves pedate, leaflets 3, 4 and 5, of medium size and slightly lax. Petiole shorter than the basal leaflets of quinate leaves, like the petiolules pubescent and armed with small curved prickles. Leaflet grass green above and below, with scattered short hairs, unequally serrate and long acuminate; the terminal leaflet cordate ovate, the two intermediate leaflets obovate, unequal at the base, the two basal leaflets on 2-3″ stalks: the lateral leaflets of the ternate leaves ovate-cordate, broader on the outer margin. Stipules filiform, inserted at the base of the petiole. Flowering branch slender, round, branched; prickles recurved, greenish-yellow, scattered on the rachis, very many on the peduncles, pedicels and calyces. The hair is very thin, short, and on the pedicels and calyx hardly noticeable. Leaves ternate, the upper ones simple, cordate, and resembling those on the leaf-stem. Panicle very compound, pyramidal, branches spreading, the lower ones large and again forming similar compound panicles, the following ones simple, panicled, the upper ones racemose and cymose, the uppermost 1-2 flowered, bracteoles simple and trifid. Pedicels slender, the terminal flowers usually shorter than the lateral ones. Calyx green, the tips always leafy-pointed, lengthened, and directly after going out of flower coming up and clasping the fruit. Petals oval, cuneate at the base, white. Stamens white. Styles greenish. Fruit still not ripe at the end of September. Flowering from August to October.

The light green colour of the leaves, stem, prickles, etc., makes it recognizable from afar, and gives it a striking appearance, especially as all other stems of brambles are as a rule brown on high sunny mountains. Is found only in two strong bushes on a sunny mountain near Eupen.—Wilhelm Ley.

It is plain that Ley has described a radical inflorescence, which is always immensely branched, floriferous, late in commencing and long continuing to flower. The English bushes have moderate sized panicles and flower in July.

The following name should follow R. DERASIFOLIUS in the foregoing list:—

R. PSEUDO-BELLARDII Sudre, as R. TERETICAULIS var. PSEUDO-BELLARDII in Ronces bretonnes, p. 20, *Soc. Etudes Sci. Angers* (1904), comb. nov. W. Wats. The bramble is found in some quantity in Coombe Wood, adjoining Wimbledon Common, Surrey. It occurs also in Buckhurst Park, E. Sussex, whence it has presumably been derived. It is easily picked out by its very large leaves and erect sepals.

A bramble which appeared on Hayes Common, W. Kent, about 1945, and appears to have become extinct, much resembled, and probably was the same as, R. FRONDICOMUS Foerst. (R. SCABER var. FOLIOSUS Kalt.), a bramble which I studied and collected near Aachen in 1937. It is known only in that locality on the Continent. The bramble has now been found in a new station on Hayes Common, between Chatham's Ride and the Croydon Road. I am investigating its relationship to a very similar, probably identical bramble frequent around Tunbridge Wells, which I have under cultivation. All three brambles are evidently related to R. FUSCUS: provisionally I identify them as R. FRONDICOMUS Foerst.

It now remains only to describe and name the new species and variety found in the area.

RUBUS AVERYANUS sp. nov. (after C. Avery of Fulham) (SILVATICI Calvescentes). Eglandular. Stem arching, green to yellowish-brown, pilose; prickles many, patent to recurved, yellow to crimson, often in pairs and straying off the angles; pricklets very rare. Leaves light green, quinate, pedate; petiole closely pilose, prickles small, falcate; terminal leaflet cordate ovate, subelliptical or obovate, acuminate, strigose above, pubescent and pectinate-pilose on the veins beneath, sharply, rather coarsely irregularly serrate-dentate, a little undulate. Panicle pyramidal, truncate, interrupted below, the lowest branch usually strongly developed, the upper part racemose or subracemose, dense; rachis hirsute, like the peduncles, pedicels and calyces armed with crowded, yellow, falcate prickles. Flowers medium; sepals ovate with prolonged linear leafy tip, greyish-green, white bordered, felted and pilose, becoming erect after flowering; petals somewhat lilac-pink, broad ovate to obovate; stamens pink (occasionally white), slightly longer than the greenish styles; carpels subglabrous; receptacle pilose. Fruit ovoid, abundant.

Type specimen gathered 19.7.1937 by C. Avery on Walton Heath, near Colley Hill, Surrey, deposited at the Natural History Museum, South Kensington, London.

Distribution: Walton Heath, in several spots around the southern end of the Golf Course, Surrey, v.-c. 17, *C. Avery & W. C. R. Watson.* Broadmoor, near Leith Hill and Wootton Common, Surrey, v.-c. 17, *C. Avery.*

Flavescens, armatissimus, eglandulosus, fertilis. Turio pilosus, aculeis crebre, aculeolis rarissime munitus. Foliolum terminale cordatum ovatum ellipticum vel obovatum acuminatum, argute irregulariter serratum dentatum, subtus in venis pubescens ac pectinatum pilosum. Inflorescentiae pyramidalis ramuli superiores ascendentes uniflori vel biflori, rachis hirsuta cum pedunculis pedicellis calycibus aculeis falcatis dense instructa. Flores mediocres; sepala ovata longe producta, extus tomentosa et pilosa, post anthesin laxe erecta; petala lilacina roseola, lata ovata vel obovata; stamina roseola (raro alba) stylos pallentes paulo superantia; carpella glabrescentia; receptaculum pilosum. Fructus ovoidei, copiosi.

RUBUS EGREGIUS var. nov. PLIOCENICUS [so named because it is frequent on, and apparently confined to, the plain formed by the Lenham (early Pliocene) sea on the North Downs between the Surrey border and the R. Darenth in West Kent]. Differt foliolo terminali angusto elliptico oblongo vel rhomboideo, basi integro, petiolulo proprio brevi, margine aliquantum grosse irregulariter angulato serrato, floribus parvis, petalis angustis argute bifidis, staminibus stylos roseolos aequantibus. Habet praeterea sepala attenuata et receptaculum hirsutum.

This bramble is recorded in Rogers's *List of Rubi in the Neighbourhood of London* (*op. cit.*), as " R QUESTIERII Lef. & Muell., a very glandular form, abundant at Halstead, W. Kent, seen only there." In the *London Naturalist, 1928*, 24-25 (1929), appears a full description of the bramble. Type specimen gathered 25.8.1948 by W. C. R. Watson, deposited at The Natural History Museum, South Kensington.

Rubus iodnephes sp. nov. (*iodnephes*, deep violet). (Section Radulae ad interim). Axes becoming deep violet in the sun. Stem angled slightly furrowed, striate, glaucescent, glabrous or nearly so, stalked glands few, short, acicles and slender pricklets short, some minute, numerous, unequally distributed, yellowish, prickles from the first red-based, medium to short, seated on the angles, a few patent, the rest falcate and much recurved. Leaves quinate subpedate, petiole flat above, prickles small geniculate, stipules linear lanceolate gland-fimbriate; terminal leaflet rather broad elliptical-ovate acuminate-cuspidate, base cordate, folded, slightly strigose above, thinly pubescent to greenish-grey felted beneath, margin irregularly to slightly compound serrate, or partly crenate-dentate mucronate, and furnished with scattered microglands. Panicle subpyramidal below, broad and nearly equal above, usually with several simple leaves, branches deeply divided, rachis glabrescent below pubescent and felted above, armed with short stout recurved prickles and many short, some minute, acicles and stalked glands, the prickles of the peduncles and pedicels abundant, yellowish, slender straight to recurved. Flowers about 2 cm. across: sepals greenish, pubescent and felted white-bordered, leafy-tipped, muricate glandular punctate, patent after flowering then loosely reflexed; petals pure white, obovate, glabrous; stamens white, slightly longer than the greenish styles, becoming connivent; carpels glabrous; receptacle pilose. Fruit moderately large, ovoid, early, sour. Very fertile.

Type specimen gathered by W. C. R. Watson flowering 23.6.50, fruiting 26.7.50, at Barnes Common, Surrey, deposited at the Natural History Museum, South Kensington, London.

Distribution: Barnes Common, both east and west of the Railway Station; Palewell Common; Sheen Common; all in Surrey, v.-c. 17.

Turio nigroviolaceus glaucescens, glaber, glandulis stipitatis cum aciculis et aculeolis pallentibus brevibus atque nonnullis minutis hinc parce hinc largiter praeditus; aculei mediocres. Folia infra pubescentia, ea sero aperientia cano-tomentosa; foliolum terminale latiusculum ovatum ellipticum, haud longe acuminatum, irregulariter vel subcomposito-serratum dentatum. Panicula ad apicem truncatum vix angustata, pubescens et tomentosa, ramulis alte divisis, aculeis valde recurvis defensa, cum aciculis aculeolis glandulis ut in turione. Flores mediocres; sepala subcinerea subviridia, muricata, post anthesin patula deinde laxe reflexa; petala obovata, alba, glabra; stamina alba stylos pallentes superantia atque petalis delapsis super eos parumper conniventia. Fructus ovoidei, acidi, maturescunt exeunte julio.

Rubus spadix sp. nov. (*spadix*, chestnut brown, alluding to the colour of the bases of the prickles). (Apiculati Pallidi.) Robust. Stem procumbent up to nine metres long, green to pruinose purple, obtuse angled somewhat hairy to glabrous, stalked glands and acicles crowded short; prickles many unequal rather short, declining or falcate, their base chestnut brown and often bearing acicles and glands. Leaves rather large, deep green, 3-5-nate pedate, subglabrous above, pubescent and greyish-white (rarely sub-tomentose) to green beneath, at length rugose, petiolar prickles hooked; terminal leaflet broad cordate ovate mucronate or cuspidate, to elliptical with base entire, teeth fine shallow subequal, the principal teeth patent. Panicle ± thyrsoid, mid branches 5-flowered cymose (lower branches of lower panicles sometimes more spreading), the terminal leaflets long oblong finely acuminate, rachis clothed with felt and dense short hair, and bearing many acicular prickles, which are in part patent and sometimes gland-tipped. Flower buds not lobed, their base discoid. Flowers 2.5 cm.: sepals dark green white-bordered, pubescent and slightly pilose, greenish at the base within, ovate lanceolate, patent to erect; petals light pink, elliptical obovate, distinctly and greenish clawed, slightly fimbriate at the retuse, erose or truncate apex; stamens white, mostly rather shorter than the pallid reddish-based styles; carpels glabrous; receptacle moderately pilose. Very fertile.

Type specimens gathered in Gravelpit Lane, Eltham, (1) flowering piece, (2) fruiting piece, by W. C. R. Watson, deposited at the Natural History Museum, South Kensington, London.

Distribution:—Shooters Hill, W. Kent, v.-c. 16, where until recently it was to be found in the old lane that winds uphill past the Tea Pavilion to the Bull Inn; Gravelpit Lane, Eltham, the disconnected southern part of the same old lane referred to above. Between Inskip and Elswick, W. Lancs., v.-c. 60, Ref. No. 1565 E. S. Marshall, 5.8.1895, as a "very exceptionally strong (North of England) PODOPHYLLUS P.J.M., teste Rogers". Near Charlesworth (for Chisworth), N. Derby, v.-c. 57, W. R. Linton, Aug. 1894, as R. PODOPHYLLUS P.J.M., in the *Set of British Rubi*, No. 91. Barnetby, N. Lincs., v.-c. 54, A. Ley, Ref. No. 484, Aug. 1907 as R. PODOPHYLLUS P.J.M. Haw Bank, Woodhall, near Carperby, Wensleydale, N.W. Yorks., v.-c. 65, collector ?.

Validus, atroviridis. Turio procumbens, obtusangulus, tandem pruinosus purpureus, glabrescens, glandulis breve stipitatis aciculis brevibus aculeis badiis declinatis falcatisve crebe praeditus. Folia 3-5-nata pedata, saturate viridia, supra subglabra, subtus pro more pubescentia; foliolum terminale ovatum vel ellipticum breve cuspidatum, tenuiter patenti-serratum. Panicula aequalis, ad apicem densa, inferne raro ramulis remotis longioribus patentibus, rachide pubescenti crebre glandulosa aciculata debile aculeata, foliolis terminalibus longis oblongis. Sepala ovata lanceolata, atroviridia, denique erecta. Petala dilute rosea, elliptica obovata vulgo retusa. Stamina alba stylos rubescentes plus minusve aequantia. Germina glabra. Receptaculum pilosum. Fertilis. Haud raro inveniuntur glandulae parvae stipitatae ad margines vel ad costas foliorum caulinorum et in pagina superiori foliorum summorum paniculae.

GEUM L.

G. URBANUM L. *Wood Avens, Herb Bennett.* Woods, thickets and shady places. Common and widely distributed in all the v.-cc.

G. RIVALE L. *Water Avens.* Pond and streamsides. Very rare. V.-c. 18. Pond side, Chingford, 1936, *J.R.*; streamside, High Beech, 1938, *W.E.G.*; *Hb.L.N.H.S.* The plant should also be searched for in marshy meadows, damp woods and stream and canal banks, particularly near Chertsey, Surrey, and Colnbrook in Middlesex and Bucks.

FRAGARIA L.

F. VESCA L. *Wild Strawberry.* Woods and hedgebanks. Frequent and well distributed throughout the area.

F. × ANANASSA Duchesne. *Garden Strawberry.* Alien of hortal origin. Frequently established on hedge banks, railway banks and waste ground throughout the area.

DUCHESNEA Smith.

D. INDICA (Andrews) Focke, FRAGARIA INDICA Andrews. Alien. S. Asia. V.-c. 21. Garden weed near Southall, 1946; *L.G.P.*

POTENTILLA L.

P. ANSERINA L. *Silver Weed.* Hedgebanks, waste ground, heaths, waysides and bare places. Very common in all the v.-cc.

P. ARGENTEA L. *Hoary Cinquefoil.* Heaths, hedgebanks and grassy places on sandy and gravelly soils. Rare. V.-c. 16. Bickley, 1900, *L.B.H.*; *Hb.H.* Near Abbey Wood, *F.J.H.*; *Fl. Kent*, 129. Near Bexley, 1871; Dartford, *F.J.H.*; *Hb.Mus.Brit.* Pauls Cray Common; *W.W.* Hayes; Keston, 1917; Dartford Marsh, 1931; *P.H.C.* Long Reach, Dartford, 1945, *P.H.C.*; *Hb.L.N.H.S.* Keston Common, 1945; *F.R. & J.E.L.* V.-c. 17. By Ermine Street, Leatherhead, 1919; *E.B.B.* Oxted Downs, rare, 1921; *R.W.R.* Towpath near Ham, 1945; *B.W.* Reigate Heath, 1919; *H.J.B.*; 1924; *R.W.R.*; 1932; *P.H.C.*; 1950; *B.M.C.M.* V.-c. 18. Aveley, 1908; *P.H.C.* Hangman's Wood, Grays, 1913; *W.S.* Orsett, 1913, *P.H.C.*; *Hb.L.N.H.S.* Monkham's Estate, 1907; *C.N.* Purfleet, 1936; *P.H.C.* V.-c. 20. Near Rickmansworth, 1882, *F.J.H.*; *Hb.Mus.Brit.* Broxbourne; L.B.H. Bricket Wood; North Mimms; Colney Heath; *P.H.C.* Hatfield, 1897; *C.S.N.*; Great Amwell, 1909, *P.H.C.*; *Hb.L.N.H.S.* Panshanger, 1951; *R.M.P.* Near Ware Park Sanatorium, Hertford; *S.C.M.* V.-c. 21. Uxbridge; *L.B.H.* Near Coldfall Wood, Highgate, 1888; Yiewsley, 1901 and 1916; *J.E.C.* The var. TENUILOBA Jord. is reported from v.-c. 17. Gravel pit, Ham, abundant, 1931, *J.E.L.*; *Hb.L.* See *Watson B.E.C. 1931-32 Rep.*, 122.

P. REPTANS L. *Creeping Cinquefoil.* Hedgebanks, heaths, waste ground, railway banks and waysides. Very common throughout all the v.-cc.

P. ANGLICA Laicharding, P. PROCUMBENS Sibth. *Trailing Tormentil.* Heaths and grassy places. Local. V.-c. 16. Chislehurst; *W.W.* Holwood, 1921; *E.B.B.* W. of Shoreham, 1947; *F.R.* V.-c. 17. Wimbledon Common, 1930; *R.W.R.* Mitcham Common, 1932, *E.C.W.*; Worms Heath, 1925, *J.E.L.*; *Hb.L.* Banks Common, 1925; *E.B.B.* V.-c. 18. Epping Forest, 1897, *A.W.B.*; *Hb.L.N.H.S.*; 1947; *J.B.* Near Tawney Hatch, 1926; *L.J.T.* Lambourne; *R.W.R.* V.-c. 20. Colney Heath, 1912; *C.S.N.* Broxbourne, 1924; *E.B.B.* Between Rickmansworth and Sarratt, 1925; *L.J.T.* Hatfield, 1926; *L.J.T.* Bricket Wood, 1947; *R.M.P.* V.-c. 21. Harrow Weald Common; *C.S.N.* Hampstead Heath, 1926; *C.S.N.* Horsendon Hill; Northwood; Mimmshall Wood; *D.H.K.* A large patch on grass at front of Natural History Museum, S. Kensington, 1943, *A.J.W.*; *B.E.C. 1943-44 Rep.*, 718 (1946). Bombed site, Bedford Way, W.C., 1950, *J.W.*; *Hb.Mus.Brit.*

×REPTANS. V.-c. 17. Limpsfield Road, Sanderstead, 1943, *C.E.B.*; *Hb.L.* Mitcham Common, 1949, *J.B.E.* conf. *A.M.* V.-c. 21. Near Northwood, 1895, *C.E.B.*; *Hb.Mus.Brit.*

P. ERECTA (L.) Raueschel. *Erect Tormentil.* Heaths, woodland rides and grassy places. Rather common. V.-c. 16. Frequent. V.-c. 17. Common. V.-c. 18. Epping Forest; *D.J.B.**; 1951; *L.N.H.S. Excursion.* Loughton, 1951; *R.M.P.* V.-c. 19. Epping Lower Forest, 1951; *R.M.P.* V.-c. 21. Harefield; Stanmore, Harrow Weald and Ruislip Commons; Bushy Park; Hounslow and Hampstead Heaths; Finchley Common; Horsendon Hill, 1933-51; *D.H.K.*

×ANGLICA. V.-c. 17. Banstead Heath, 1930, *C.E.B.*; *Hb.L.* V.-c. 21. Hounslow Heath; *D.H.K.*

×REPTANS. V.-c. 17. Banstead Downs, 1928; summit of Bugg Hill, Warlingham, 1943, *C.E.B.*; *Hb.L.*

P. STERILIS (L.) Garcke. *Barren Strawberry.* Hedgebanks, heaths and woods. Common in all the v.-cc.

P. NORVEGICA L. Alien. Europe. V.-c. 17. Richmond; *A.L.* By the Water Works, Carshalton, 1917; *P.H.C.* Waste ground, Mitcham Common, 1932, *J.E.L.*; *Hb.L.* Near Kingswood, 1939, *A.E.E.*; *Hb.E.C.M.* V.-c. 18. Romford, 1913, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Winchmore Hill, 1905, *P.H.C.*; *Hb.L.N.H.S.* Southgate; *L.B.H.* Kingsbury, 1910; Clapton, 1909, *P.H.C.*; *Hb.L.N.H.S.* Near Belsize Park, 1921; *P.W.R.* Uxbridge, 1912, *P.H.C.*; *Hb.L.N.H.S.* East Finchley, 1908; Crouch End, 1897; Muswell Hill, 1902; Hendon, 1916; Church End, Finchley, 1918-19 and 1923; Hackney Marshes, 1919 and 1927; *J.E.C.* Brookside Walk, Hendon; *J.B.* det. *A.J.W.* Waste ground, Chelsea Square, *R.A.G.*; *B.E.C. 1946-47 Rep.*, 290 (1948).

P. RECTA L. Alien. Europe. V.-c. 16. Near Swanscombe Wood, 1946; *F.R.*; *L.N.H.S. Excursion*; 1950; *H.M.P.* V.-c. 17. Near Ashtead Church, 1946; *T.C.D.* Old wall, Headley Lane, 1925 and 1949, *J.E.L.*; *Hb.L.* V.-c. 21. Waste ground, Ealing, one plant, 1935; *K.E.B.*

P. HIRTA L. Alien. Europe. V.-c. 21. Crouch End, 1897; Yiewsley, 1908-9; Muswell Hill; Finchley, 1910; *J.E.C.* Waste ground, Acton, 1905, *C.B.G.*; *Hb.S.L.B.I.*

*Boatman, D. J.

P. INTERMEDIA L. Alien. Europe. V.-c. 17. Waste ground near Richmond railway station, 1942-45; *B.W.* V.-c. 18. Rubbish-tip, near Ilford, 1951; *B.T.W.* det. *J.E.L.* V.-c. 21. Ealing, 1913, *A.L.*; *B.E.C. 1913 Rep.*, 319 (1914). Twickenham; *J.E.L.* Near Berkeley Square, W.1, c. 1942; *A.H.G.A.*

P. CANESCENS Bess. Alien. Europe. V.-c. 17. Sand-pit near Buckland, 1950, *E.M.C.I.*; *Hb.L.* V.-c. 21. Muswell Hill, 1920; Yiewsley, 1902; Hampton Wick, 1915; Finchley, 1915 and 1917; *J.E.C.*

P. PALUSTRIS (L.) Scop. *Marsh Cinquefoil.* Bogs. Very rare. V.-c. 18. Epping Forest, a small colony in the Sphagnum beside the lowest pond at the Cuckoo Pits, 1933; 1943, *J.R.*; *Hb.L.N.H.S.*

ALCHEMILLA L.

For an account of the micro-species of this critical genus see S. M. Walters, *Watsonia, 1*, 6-18 (1949).

A. XANTHOCHLORA Rothm., A. PRATENSIS auct. non Schmidt. Grassy places. Very rare. V.-c. 17. Wimbledon Common, 1948, *B.W.*, det. *A.J.W.*; *Hb.Mus.Brit.*; still there 1949, "originally pointed out to me by *J. W. Barlow*; almost certainly adventive"; *B.W.*

A. VESTITA (Buser) Raunk., A. MINOR auct. non Huds., A. ANGLICA Rothm., A. PSEUDOMINOR Wilmott. Damp meadows and banks. Rare. V.-c. 17. By towpath, Kew Gardens, one plant, adventive, 1946; *B.W.* Sheen Common, one plant, 1915, *A.B.J.*; *Hb.Mus.Brit.* V.-c. 20. Near Croxley Green, 1903; Bricket Wood Common, 1909, *C.S.N.*; *Hb.L.N.H.S.* Near Maple Cross, 1941; *D.H.K.* V.-c. 21. Wet meadow near Harefield Place, 1910, *J.E.C.*; *Hb.Mus.Brit.* Harefield Moor, 1941; *D.H.K.*

A. MONTICOLA Opiz, A. PASTORALIS Buser. Grassy places. Very rare. V.-c. 17. Dry meadow by Betchworth Hills Camp, not far from Upper Box Hill Farm, 1932, *J.E.L.*; *Hb.L.* teste *S. M. Walters.*

A. MOLLIS (Buser) Rothm. Alien. Asia Minor and Carpathians. Grassy place. V.-c. 17. Field near the Stepping Stones below Box Hill, 1948, *W.H.S.*; *Hb.L.* det. *S. M. Walters.* Two clumps were found hidden in long grass. For an account of this species see *J. Roy. Hort. Soc. 73*, 308.

APHANES L.

For an account of this genus see S. M. Walters, *Watsonia, 1*, 163-69 (1949), and *Lond. Nat. 29*, 21 (1950).

A. ARVENSIS L., ALCHEMILLA ARVENSIS (L.) Scop. *Parsley Piert.* Heaths, commons and cultivated ground. The aggregate plant has been noted in all the v.-cc. The segregate species is also probably rather common, though its distribution is not yet fully worked out; it has been reported as follows. V.-c. 16. Between Dartford and Greenhithe, 1886, *F.J.H.*; *Hb.Mus.Brit.* Keston, 1923, *J.E.L.*; *Hb.L.* teste *S.M.W.*

Stone, 1947, *H.M.P.*; *Hb.Mus.Brit.* det. *E.B.Ba.* V.-c. 17. Warlingham, 1923; near Selsdon, 1926, *J.E.L.*; *Hb.L.* det. *S.M.W.* Tandridge, 1935; *J.B.E.* teste *E.B.Ba.* V.-c. 20. Hertford; *S.C.M.* V.-c. 21. Near Edgware, 1871, *F.J.H.*; *Hb.Mus.Brit.* Harefield; Harmondsworth; Staines; *D.H.K.* V.-c. 24. Between Denham and Uxbridge, 1950. *D.H.K.*; *Hb.K.*

A. MICROCARPA (Boiss. & Reut.) Rothm. Heaths, commons and grassy places. Possibly rather local, though its distribution in the area has not yet been fully worked out. V.-c. 16. Farningham, 1950; *E.B.Ba.* V.-c. 17. Coombe Wood, Croydon, *D.P.Y.*; *Watsonia*, *2*, 197 (1952). Bookham Common, 1950; *E.B.Ba.* Spring Park Wood, West Wickham, 1927, *F.G.S.*; Esher, 1931, *J.E.L.*; *Hb.L.* det. *S.M.W.* Ham Common, 1950; *B.W.* V.-c. 21. Ruislip Common; Hounslow Heath, 1950; *D.H.K.* Golf course, Hampton Court Home Park, abundant, 1951; *N.Y.S.*

AGRIMONIA L.

A. EUPATORIA L. *Common Agrimony.* Downs, heaths. commons, hedgebanks, railway banks and grassy places. Common and widely distributed in all the v.-cc. The var. SEPIUM Bréb. may be not uncommon.

A. ODORATA (Gouan) Mill. *Fragrant Agrimony.* Hedgebanks, wood borders and grassy places on clay soils. Locally abundant, though much confused with the previous species. Some of the records may need revision. V.-c. 16. S. side of Pett's Wood, 1930; *R.W.R.* V.-c. 17. Edge of Nower Wood, Headley, 1917, *E.B.B.*; *Hb.B.*; 1942; between Chessington and Oxshott, 1942, *A.E.E.*; *Hb.E.C.M.* Limpsfield, very local, 1921; *R.W.R.* Near Weybridge. 1922; *W.W.* Coombe Wood, near Richmond, *T.A.D.*; *Fl. Surrey*, 288. Wood near Banks Common, 1930; Oxshott Heath; *E.B.B.* Near Cobham, 1950; *B.W.*; *L.N.H.S. Excursion*. V.-c. 20. Cuffley; *L.B.H.*

POTERIUM L.

P. SANGUISORBA L. *Salad Burnet.* Downs, meadows, railway banks and roadsides. Rather common, especially on calcareous soils. V.-c. 16. Frequent on the chalk. V.-c. 17. Plentiful on the chalk, and on alluvial soils in the vicinity of the Thames. V.-c. 20. Croxley Mills, 1904, *C.S.N.*; *Hb.L.N.H.S.* Springwell; Rickmansworth, 1950; *D.H.K.* Panshanger, 1951; *R.M.P.* V.-c. 21. Common on the chalk at Harefield and Springwell, and by the Thames from Staines to Hampton Court. Railway banks between Colnbrook and West Drayton, 1951; *D.H.K.* V.-c. 24. Denham, 1912, *P.H.C.*; *Hb.L.N.H.S.* Iver; *P.H.C.* Wraysbury Rifle Range; *C.S.N.*

P. POLYGAMUM Waldst. & Kit. Alien. Europe. Cultivated as a fodder crop and found naturalised on field borders. railway banks and in grassy places. Not common. V.-c. 16. Rough field, Green Street

Green, near Farnborough, 1937, *J.E.L.*; *Hb.L.* V.-c. 17. Denbies Drive, Dorking, 1929; near Perrot's Farm, Burgh Heath, 1926, *E.C.W.*; Ham gravel pits, 1931. *J.E.L.*; *Hb.L.*; 1944; *D.H.K.* V.-c. 21. Railway banks between Uxbridge and West Drayton, 1945; *D.H.K.*

SANGUISORBA L.

S. OFFICINALIS L., POTERIUM OFFICINALE (L.) A. Gray. *Great Burnet.* Meadows and railway banks on heavy soils. Locally abundant. V.-c. 21. Abundant in meadows at Whitchurch, 1906, *C.S.N.*; *Hb.L.N.H.S.* Edgware, 1906; *C.S.N.*; 1908-12; *J.E.C.*; 1910, *P.H.C.*; *Hb.L.N.H.S.* By Brent Reservoir, Hendon, 1910; *C.S.N.*; 1931, *J.E.L.*; *Hb.L.*; 1951; D.H.K. Kingsbury, 1910, *P.H.C.*; *Hb.L.N.H.S.* Golf course, Perivale, 1944; *B.W.*; 1951; *D.H.K.* Near Ealing, 1902; *C.B.G.* Near Uxbridge, 1913, *P.H.C.*; *Hb.L.N.H.S.* By the railway, West Hampstead, one plant, 1948; *R.A.G.* V.-c. 24. Thorney; *P.H.C.*

ROSA L.

We are indebted to Mr. N. Y. Sandwith for much helpful criticism in compiling an account of this critical genus. He has also kindly named, or commented upon, nearly all the specimens in *Hb. Kent.* The records are arranged in accordance with A. H. Wolley-Dod's *Revision of the British Roses*; *Supplement to J. Bot., 68-69* (1930-31). Much of the material in *Herb. Bishop* has been seen and commented upon by the late Lt.-Col. Wolley-Dod, who was the leading British rhodologist of his time. E. B. Bishop was also an authority on this difficult and complex genus.

R. ARVENSIS Huds. *Trailing Rose, White-flowered Dog Rose.* Woods, hedges and bushy places, especially on stiff soil. Common and well distributed in all the v.-cc.

var. VULGARIS Ser. This appears to be the common form in the area.

forma HISPIDA Lej. & Court. V.-c. 21. Copse Wood, Northwood, 1947, *D.H.K.*; *Hb.K.* "Fruit feebly glandular; it may come under this form"; *N.Y.S.*

forma MAJOR Coste. V.-c. 17. Near Guildford, 1926, *E.B.B.*; *Hb.B.* Between Bookham Common and Leatherhead, 1929, *J.E.L.*; *Hb.L.* teste *A.H.W.-D.* Sheen Common, 1942, *N.Y.S.*; *Hb.Kew.* V.-c. 21. Stanmore Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.* V.-c. 24. Black Park, 1950; *D.H.K.*

var. OVATA (Lej.) Desv. V.-c. 17. Sheen Common, 1942, *N.Y.S.*; *Hb.Kew.* V.-c. 21. Ruislip Lido Common, 1942, *N.Y.S.*; *Hb.Kew.* Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

R. STYLOSA Desv. Hedges. Rare.

var. SYSTYLA (Bast.) Baker. V.-c. 17 Limpsfield, 1925; *R.W.R.* Mickleham Downs, 1941, *R.M. & N.Y.S.*; *Hb.Kew.* V.-c. 19. Epping Long Green, 1929, *C.E.B.*; *Hb.B.* V.-c. 20. Broxbourne, 1920, *E.B.B.*; *Hb.B.*

forma LANCEOLATA (Lindl.) W.-Dod. V.-c. 17. Mickleham Downs, 1925, *E.B.B.*; *Hb.B.* Ham Common, 1930, *N.Y.S.*; *Hb.Kew* fide *A.H.W.-D.*

var. VIRGINEA (Rip.) Rouy. V.-c. 16. Chislehurst Common, 1915, *C.E.B.*; *Hb.B.*

var. CHLORANTHA (Sauz. & Maill.) Rouy. V.-c. 17. Telegraph Hill, near Ashtead, 1931, *M.L.We.**; *Hb.Kew* (ex *Hb.L.*); 1941, *R.M. & N.Y.S.*; *Hb. Kew.*

R. SPINOSISSIMA L. *Burnet Rose.* Commons, on light soils. Very local. V.-c. 17. Ham Common, 1944; *B.W.*

var. TYPICA W.-Dod. V.-c. 17. Barnes Common, 1942, *J.E.L.*; *Hb.L.*; 1948 and 1951; *L.N.H.S. Excursions.*

forma PIMPINELLIFOLIA W.-Dod. V.-c. 17. Barnes Common, 1948; *L.N.H.S. Excursion* det. *D.H.K.*

var. RIPARTII (Déségl.) N.E.Br. V.-c. 17. Barnes Common, 1925; *H.J.B.*; 1926, *E.B.B.*; *Hb.B.*; 1931; *E.B.B.*

×R. GLABRA W.-Dod, R. SPINOSISSIMA × CANINA. V.-c. 17. Barnes Common, 1921, *C.L.W.*; *Hb.B.*; 1931; *H.J.B.*; 1942, *N.Y.S.*; *Hb.Kew*; 1948, *J.E.L.*; *Hb.L.*; 1951; *L.N.H.S. Excursion.*

R. CANINA L. *Dog. Rose.* Hedges, woods and thickets. Very common throughout the area.

var. LUTETIANA (Lém.) Baker. V.-c. 16. Greenhithe, 1951; *D.H.K.* V.-c. 17. Tadworth, 1929, *J.E.L.*; *Hb.L.* teste *A.H.W.-D.* Bookham and Wimbledon Commons, 1950; *D.H.K.* V.-c. 21. Frequent; *D.H.K.* V.-c. 24. Iver, 1948; *D.H.K.*

forma LASIOSTYLIS Borb. V.-c. 21. Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. SPHAERICA (Gren.) Dum. V.-c. 17. Near Guildford, 1926, *E.B.B.*; *Hb.B.* Ham Common, 1930, *N.Y.S.*; *Hb.Kew* fide *A.H.W.-D.* Mickleham Downs, 1942, *R.M. & N.Y.S.*; *Hb.Kew.*

var. FLEXIBILIS (Déségl.) Rouy. V.-c. 17. Palewell Common. Richmond, 1931, *N.Y.S.*; *Hb.Kew* fide *A.H.W.-D.* Near Beverley Brook,

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*Wedgwood, Mrs. M. L.

Coombe, 1942, *N.Y.S.*; *Hb.Kew.* V.-c. 21. Northolt; Finchley Common, plentiful, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. SENTICOSA (Ach.) Baker. V.-c. 17. Banks Common; *E.B.B.* Ham Common, 1930, *N.Y.S.*; *Hb.Kew* fide *A.H.W.-D.* Wimbledon Common. 1941, *R.M.* & *N.Y.S.*; *Hb.Kew.* V.-c. 21. Harefield Moor, 1947, *N.Y.S.* & *D.H.K.*; Stanmore Common; near Harefield; Northolt; West Heath, Hampstead; Hounslow Heath; between Hanwell and Greenford; Horsendon Hill; Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

forma MUCRONULATA (Déségl.) W.-Dod. V.-c. 17. Ham Common, 1927; Bookham Common, 1929; Leatherhead Downs, 1925, *E.B.B.*; *Hb.B.* Near Beverley Brook, Coombe, 1942. *N.Y.S.*; *Hb.Kew.* V.-c. 21. Northolt, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. SPURIA (Pug.) W.-Dod. V.-c. 17. Near Guildford, 1926, *E.B.B.*; *Hb.B.* Pebblecombe Hill, Buckland, 1928, *J.E.L.*; *Hb.Kew* fide *A.H.W.-D.* Palewell Common, Richmond. 1931, *N.Y.S.*; *Hb.Kew* fide *A.H.W.-D.* By Beverley Brook, Coombe, 1942, *N.Y.S.*; *Hb.Kew.* V.-c. 21. Harefield Moor, 1947, *N.Y.S.* & *D.H.K.*; Mad Bess Wood, Ruislip; Stanmore Common; near Yiewsley; Dawley; Hayes; Northolt; Hanwell; Hanger Hill, Ealing; Hendon; Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

forma SYNTRICHOSTYLA (Rip.) Rouy. V.-c. 21. Near Yeading, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. RAMOSISSIMA Rau. V.-c. 17. Headley Lane; *E.B.B.* Near Guildford, 1934, *E.B.B.*; *Hb.B.* Ham Common, 1942, *N.Y.S.*; *Hb.Kew.* V.-c. 21. Stanmore Common; Eastcote; between Iver and Yiewsley; Dawley; Colham Green; Staines Moor; Cranford; Northolt, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. DUMALIS (Bechst.) Dum. V.-c. 17. Box Hill, 1929, *J.Fr.* & *M.L.We.*; *Hb.L.* fide *A.H.W.-D.* Near Leatherhead, 1929; *J.E.L.*; *Hb.Kew* fide *A.H.W.-D.* V.-c. 21. Common; *D.H.K.* V.-c. 24. Black Park, 1951; *D.H.K.*

forma VIRIDICATA (Pug.) Rouy. V.-c. 17. Ham Common, 1930, *N.Y.S.*; *Hb.Kew* fide *A.H.W.-D.* Banks Common, 1927, *E.B.B.*; *Hb.B.* V.-c. 21. Stanmore Common; Northwood; Cranford; Roxeth, Harrow; Kenton; Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

forma CLADEOLIA (Rip.) W.-Dod. V.-c. 21. Pield Heath; near Laleham; Horsendon Hill; Brentford; Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. STENOCARPA (Déségl.) Rouy. V.-c. 20. Broxbourne, 1924, *E.B.B.*; *Hb.B.*

var. CARIOTI (Chab.) Rouy. V.-c. 17. Epsom Common, 1928, *J.E.L.; Hb.L.* fide *A.H.W.-D.*

var. FRAXINOIDES (H.Br.) W.-Dod forma RECOGNITA (Rouy) W.-Dod. V.-c. 17. Box Hill, 1933, *C.L.W.*; *Hb.B.*

var. SYLVULARUM (Rip.) Rouy. V.-c. 17. By Beverley Brook, Coombe, 1942, *N.Y.S.*; *Hb.Kew.* V.-c. 21. Uxbridge Moor, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. ANDEGAVENSIS (Bast.) Desp. V.-c. 17. Leatherhead Downs, 1926, *C.E.B.*; *Hb.L.* fide *A.H.W.-D.* Oxted, 1930; *R.W.R.* V.-c. 21. Finchley Common, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. VERTICILLACANTHA (Mérat.) Baker. V.-c. 17. Epsom Downs, 1925, *E.B.B.*; *Hb.B.* V.-c. 21. Harefield Moor, 1947, *N.Y.S. & D.H.K.; Hb.K.* det. *N.Y.S.*

forma CLIVICOLA (Rouy) W.-Dod. V.-c. 21. Greenford, 1947, *D.H.K.; Hb.K.* det. *N.Y.S.*

var. SCHOTTIANA Ser. V.-c. 21. Uxbridge Moor, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. POUZINII (Tratt.) W.-Dod forma WOLLEY-DODII Sudre. V.-c. 17. Ham Common, 1927, *C.L.W.;* 1931; *J.Fr.*; *Hb.B.;* 1930; 1942, *N.Y.S.; Hb.Kew.* Telegraph Hill, near Ashtead, 1931, *J.E.L.; Hb.Kew.* V.-c. 21. Ruislip Lido Common, 1942, *N.Y.S.; Hb.Kew.*

var. BLONDAEANA (Rip.) Rouy forma VINACEA (Baker) Rouy. V.-c. 17. Box Hill, 1933, *C.L.W.; Hb.B.* Near Banks Common; *E.B.B.* fide *A.H.W.-D.*

R. DUMETORUM Thuill. *Dog Rose.* In similar situations to the preceding species. Common and widely distributed throughout the area.

var. TYPICA W.-Dod. V.-c. 17. Palewell Common, Richmond, 1942, *N.Y.S.*: *Hb.Kew.* V.-c. 21. Near Harefield; Denham, 1946-47, *D.H.K.; Hb.K.* det. *N.Y.S.* V.-c. 24. Denham, 1949; *D.H.K.*

forma URBICA (Lém.) W.-Dod. V.-c. 17. Common; *D.H.K.* V.-c. 21. Common; *D.H.K.*

forma SEMIGLABRA (Rip.) W.-Dod. V.-c. 21. Harefield Moor; Hatch End, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.* Highgate Ponds, 1949, *D.H.K.*; *Hb.K.*

var. GABRIELIS (F. Gér.) R. Kell. V.-c. 21. Cowley Peachey, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. CALOPHYLLA (Rouy) W.-Dod. V.-c. 21. Harefield Moor, 1947, *N.Y.S. & D.H.K.*; *Hb.Kew* det. *N.Y.S.*

var. HEMITRICHA (Rip.) W.-Dod. V.-c. 17. Mickleham Downs, 1925, *E.B.B.*; *Hb.B.* Leatherhead Downs, 1942, *N.Y.S.*; Mickleham Downs. 1941, *R.M. & N.Y.S.*; *Hb.Kew.* V.-c. 21. Near Harefield Moor; Uxbridge Moor; Cowley Peachey; Shortwood Common, Staines; near Poyle; Harrow, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

var. ERECTA W.-Dod. V.-c. 19. Epping Long Green, 1929, *C.E.B.*; *Hb.L.* fide *A.H.W.-D.*

var. INCERTA (Déségl.) W.-Dod. V.-c. 17. Mickleham Downs, 1925, *E.B.B.*; *Hb.B.* V.-c. 21. Ruislip Common, 1946, *N.Y.S.*; *Hb.Kew.*

forma LAEVISTYLA W.-Dod. V.-c. 18. High Beech, 1929, *B.T.W.*; *Hb.B.* V.-c. 21. Deacon's Hill; Elstree, 1946-47, *D.H.K.*; *Hb.K.* det. *N.Y.S.*

R. AFZELIANA Fries, R. GLAUCA Vill. Hedges and thickets. Very rare.

var. GLAUCOPHYLLA (Winch) W.-Dod. V.-c. 17. Warlingham, 1932, *C.E.B.*; *Hb.B.* Mickleham Downs, 1941, *R.M. & N.Y.S.*; *Hb.Kew.*

R. OBTUSIFOLIA Desv. Hedges and thickets. Local. V.-c. 16. Dartford, 1947; *D.H.K.* V.-c. 17. Epsom Downs; Wimbledon Common, 1943, *J.E.L.*; *Hb.L.* V.-c. 21. Stanwell Moor; Horsendon Hill; Hounslow; *D.H.K.*

var. TYPICA W.-Dod. V.-c. 17. Limpsfield Common, 1925 and 1934; Banks Common, 1927, *E.B.B.*; *Hb.B.* Wimbledon Common, 1941, *R.M. & N.Y.S.*; *Hb.Kew.* V.-c. 21. Harefield Moor, 1947, *N.Y.S. & D.H.K.*; West Drayton; Hounslow Heath, 1947, *D.H.K.*; *Hb.K.*

var. TOMENTELLA (Lém.) Baker. V.-c. 17. Limpsfield and Itchingwood Commons, 1925 and 1934, *E.B.B.*; Ham Common, 1927, *C.L.W. & E.B.B.*; Banks Common, 1927; Bookham Common, 1934, *E.B.B.*; *Hb.B.* Wimbledon Common, 1943, *J.E.L.*; *Hb.Kew.* V.-c. 20. Near Broxbourne, 1924, *C.L.W.*; *Hb.B.* V.-c. 21. Drayton Ford, 1946. *J.E.L. & D.H.K.*; *Hb.K.* det. *N.Y.S.*

forma CANESCENS (Baker) W.-Dod. V.-c. 17. Ham Common, 1930, *N.Y.S.*; *Hb.Kew* teste *A.H.W.-D.* V.-c. 20. Near Broxbournebury, 1924, *C.L.W.*; *Hb.B.*

var. DECIPIENS (Dum.) W.-Dod forma GLANDULOSA (Crép.) W.-Dod. V.-c. 17. Telegraph Hill, near Ashtead, 1941, *R.M. & N.Y.S.*; Ham Common, 1942, *N.Y.S. & J.P.M.B.*; *Hb.Kew.* V.-c. 18. High Beech. 1929, *B.T.W.*; *Hb.B.*

var. ROTHSCHILDII (Druce) W.-Dod. V.-c. 17. By Beverley Brook, near Coombe, 1942, *N.Y.S.*; *Hb.Kew.*

R. TOMENTOSA Sm. *Downy Rose.* Hedges and thickets. Local. V.-c. 17. Chipstead, 1925; *R.W.R.* N. of Rook's Nest, Godstone, 1943; near Warlingham, 1943, *J.E.L.*; *Hb.L.* Near Oxted, 1923, *R.W.R.*; *Hb.B.* Limpsfield Common, *R.W.R.*; *Lond. Nat.*, *19*, 26 (1940).

var. TYPICA W.-Dod. V.-c. 17. Above Oxted, 1924, *R.W.R.*; *Hb.B.* V.-c. 21. Horsendon Hill, 1948; *W.W.*; 1949; *D.H.K.*

forma EGLANDULOSA W.-Dod. V.-c. 17. Above Oxted, 1924, *R.W.R.*; *Hb.B.*

var. PSEUDO-CUSPIDATA (Crép.) Rouy. V.-c. 17. Itchingwood Common, Limpsfield, 1924, *R.W.R.*; *Hb.B.*

var. SCABRIUSCULA Sm. V.-c. 17. Mickleham Downs, 1945, *N.Y.S.*; *Hb.Kew.*

var. BRITTONII W.-Dod. V.-c. 17. Marden Park, 1914, *C.E.B.*; *Hb.B.*

R. SHERARDI Davies. Hedges and thickets. Very rare.

var. TYPICA W.-Dod. V.-c. 17. Marden Park, Woldingham, 1924, *E.B.B.*; *Hb.B.* V.-c. 18. Near High Beech Church, Epping Forest, 1926, *B.T.W.*; *Hb.B.*

var. OMISSA (Déségl.) W.-Dod. V.-c. 17. Above Oxted, 1924, *R.W.R.*; *Hb.B.*

R. RUBIGINOSA L., R. EGLANTERIA L. *Sweet Briar.* Hedges, thickets and downs, especially on the chalk. Local. V.-c. 16. Between Eynsford and Romney Street, 1929; *R.W.R.* V.-c. 17. Chipstead Valley, 1943; Epsom Downs, 1943; Box Hill, 1945, *J.E.L.*; *Hb.L.* Oxted Downs, 1925; Riddlesdown, 1928; *R.W.R.* V.-c. 21. Hampstead Lane, Highgate, 1947, *D.H.K.*; *Hb.K.* det. *N.Y.S.* as "hortal form".

var. TYPICA W.-Dod. V.-c. 17. Box Hill, 1925, *E.B.B.*; *Hb.B.*

var. ROTUNDIFOLIA Rau. V.-c. 17. Effingham Common, 1934, *E.B.B.*; *Hb.B.*

var. ECHINOCARPA (Rip.) Gren. V.-c. 17. Box Hill, 1933, *C.L.W.*; *Hb.B.*

R. MICRANTHA Sm. *Sweet Briar.* Hedges, thickets and downs, especially on the chalk. Local. V.-c. 17. Oxted Downs, 1923-24; Park Down, Chipstead; Riddlesdown, 1928; *R.W.R.* Banks Common, 1925; *E.B.B.* Nore Hill, Warlingham; South Hawke; Walton Downs, 1943, *J.E.L.*; *Hb.L.* V.-c. 21. South Mimms; *C.B.G.* V.-c. 24. Dromenagh, near Iver, 1924; *E.B.B.*

var. TYPICA Christ. V.-c. 17. Great Bookham Common; *E.B.B.* fide *A.H.W.-D.* Mickleham Downs, 1946; *D.H.K.* V.-c. 20. Near Broxbournebury, 1924, *E.B.B.*; *Hb.B.*

var. OPERTA (Pug.) W.-Dod. V.-c. 17. Itchingwood Common, Limpsfield, 1925, *R.W.R.*; *Hb.R.*

var. HYSTRIX (Lém.) Baker. V.-c. 17. Box Hill, 1933, *C.L.W.*; *Hb.B.*

R. MULTIFLORA Thunb. Alien. Japan and Korea. Garden escape. Naturalised in hedges. Very rare. V.-c. 21. Hayes, 1950; *E.K.*, "a pink-flowered form" teste *N.Y.S.*

MALUS L.

M. SYLVESTRIS (L.) Mill., PYRUS MALUS L. *Crab.* Woods, copses, plantations and hedges. Common throughout the area.

PYRUS L.

P. COMMUNIS L. *Wild Pear.* Woods, copses, plantations and hedges. Not common. V.-c. 16. Chislehurst Common, plentiful; *W.W.* V.-c. 17. Oxted, 1917; Thames bank between Kew and Richmond, 1918; near Limpsfield, 1925; *E.B.B.* Limpsfield Common, 1924; *R.W.R.*; 1937, *J.E.L.*; *Hb.L.* Wimbledon Common, 1936; *C.A.* Ham Common, 1948; *R.A.B.* V.-c. 18. Near High Beech Church; *C.N.* Lark's Wood; Highams Park; *R.W.R.*; 1912, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. St. Albans; *P.H.C.* Totteridge, 1946; *J.E.L. & D.H.K.* Panshanger, 1951; *R.M.P.* V.-c. 21. Hendon, 1906; *P.H.C.* Hedges, Mill Hill and Finchley, 1946; *J.E.L. & D.H.K.* Near Ditton Ferry, 1906, *C.B.G.*; *Hb.Mus.Brit.* Harefield, 1872, *F.J.H.*; *Hb.Mus.Brit.*; 1952; *D.H.K.* Thames bank, Chiswick, 1948; Scratch Wood, one tree, 1949; *R.A.B.* The var. PYRASTER L. is reported from v.-c. 16. By the Windmill, Keston Common, 1944, *J.E.L.*; *Hb.L.*; known here since 1922; *J.E.L.* V.-c. 21. Perivale Wood, 1902, *C.B.G.*; *Hb.S.L.B.I.*

SORBUS L.

S. AUCUPARIA L., PYRUS AUCUPARIA (L.) Gaertn. *Mountain Ash, Rowan.* Woods, plantations and hedges. Rather common, though often planted. V.-c. 16. Common. V.-c. 17. Frequent. V.-c. 18. Near High Beech Church, 1912; *C.N.* Theydon Mount to Stanford Rivers, 1936; *P.H.C.* Chigwell, 1939, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 19. Epping Lower Forest, 1951; *L.N.H.S. Excursion.* V.-c. 20. Rickmansworth; Watford, 1952; *D.H.K.* V.-c. 21. Rather common. V.-c. 24. Black Park, 1931; *J.C.R.*; 1950; *D.H.K.* Denham, 1934; *P.H.C.*; 1950; *D.H.K.*

S. INTERMEDIA (Ehrh.) Pers. Alien. Europe, including parts of Britain. Planted in woods. copses, plantations and hedges. Not common. V.-c. 16. Chalkpit, Swanscombe, 1947, *J.E.L. & D.H.K.*; many plants, 1951; *H.M.P.* V.-c. 17. Leatherhead Downs, 1932; roadside near Addington Pumping Station, 1932, *J.E.L.*; *Hb.L.* Roman Road, Leatherhead Downs, 1935, *E.C.W.*; *Hb.L.*

S. Aria (L.) Crantz., Pyrus Aria (L.) Ehrh. *Whitebeam.* Woods, copses, plantations and hedges. Common on the chalk, elsewhere rather rare, though sometimes planted. V.-c. 16. Frequent on the chalk. V.-c. 17. Common on the chalk. V.-c. 18. Cooks Folly Wood, 1900, *R.W.R.*; *Hb.L.N.H.S.*; 1911; *C.L.W.* V.-c. 20. Garett Wood, Springwell, 1950; *D.H.K.* V.-c. 21. Hampstead Heath, one tree; Colney Hatch Lane, one tree; *L.B.H.* Harefield, 1912; *J.E.C.*; 1951; Garett Wood, Springwell; *D.H.K.* Ken Wood, 1925; *R.W.R.* The var. cyclophylla Beck. is reported from v.-c. 17. Reigate Hill, 1933, *M.L.We.*; *Hb.L.*, the var. incisa Reichb. has been found in v.-c. 17. Reigate Hill; Roman Road near Mickleham, 1935, *E.C.W.*; *Hb.L.*, and the var. longifolia Pers. was gathered in v.-c. 17. Reigate Hill, 1935, *E.C.W.*; *Hb.L.*

S. latifolia (Lam.) Pers. Alien. Europe, including parts of Britain, Planted in woods and plantations. Rare. V.-c. 17. Leatherhead Downs, 1938, *A.E.E.*; *Hb.E.C.M.* det. *E.F.W.* Addington Hills, 1942; near Tyrell's Wood, 1949, *A.E.E.*; *Hb.E.C.M.* V.-c. 21. Between East Heath Road and Ken Wood, 1947, *V.A.*; *Hb.L.* det. *E.F.W.*

S. torminalis (L.) Crantz., Pyrus torminalis (L.) Ehrh. *Wild Service.* Woods, copses, plantations and hedges. Locally plentiful. V.-c. 16. Near Southfleet, 1919, *P.H.C.*; *Hb.B.* Chislehurst; W. of Grove Park; *W.W.* Darenth Wood, 1947; *F.R.*; 1948-50; *H.M.P.*; 1951; *F.R.* Wood W. of Swanley Junction, 1949; Bourne Wood, St. Mary Cray, several plants, 1948; Fawkham Wood, 1951; *F.R.* V.-c. 17. Wimbledon Common; near Leatherhead, 1932; *P.H.C.* Limpsfield Common, rare, *R.W.R.*; *Lond. Nat.*, *19*, 67 (1940). Frequent about Leigh, Brockham, Horley, etc., just south of our area; *J.E.L.* V.-c. 18. Cooks Folly Wood, 1900, *R.W.R.*; *Hb.L.N.H.S.* Between Theydon Bois and Theydon Garnon, 1920; *P.H.C.* Lark's Wood, Chingford, in quantity; Epping Forest; Thorndon Park; *R.W.R.* V.-c. 21. Between Perivale and Greenford, 1909, *C.B.G.*; *Hb.S.L.B.I.* Horsendon Hill, 1948; *W.W.* Bishop's Wood, Hampstead, 1909-14; *J.E.C.* Hampstead Heath, 1916; *J.E.C.*; 1926; *R.W.R.* East Finchley, 1912-14; Mill Hill, 1915-27; *J.E.C.* Queen's and Coldfall Woods, Highgate; *L.B.H.* Near Highgate; Ken Wood, 1933; *M.K.*; 1950; *D.H.K.* Between East Heath Road and Ken Wood, 1947; *V.A.* Scratch Wood; *D.H.K.*

MESPILUS L.

M. germanica L. *Medlar.* Woods and hedges on the chalk, planted elsewhere. Rare. V.-c. 16. Near Chelsfield, on the road to Lullingstone, *F.J.H.*; *Fl. Kent*, 141. Bexley, 1937, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 17. Redstone Hill, Redhill, 1936, *J.E.L.*; *Hb.L.* V.-c. 21. Near Staines Moor, 1947; *B.W.*; three trees, all cut down in 1948; *D.H.K.*

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THE Society is an amalgamation of the City of London Entomological and Natural History Society, founded in 1858, and the North London Natural History Society, founded in 1892.

Meetings are held on Tuesday evenings, either at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1, or at the Linnean Society's rooms, Burlington House, Piccadilly, W.1. The half-yearly Programme should be consulted as to the venue of any particular meeting. The room is open from 6 p.m. to 9 p.m., and meetings begin punctually at 6.30 p.m. and end about 8.30 p.m., unless other arrangements are announced. The Library and Collections are available to members after meetings at the School of Hygiene.

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At all indoor meetings specimens of Natural History interest are exhibited, and papers on various subjects are read and discussed. Visitors may be introduced by members of the Society, and are cordially welcome. Frequent field meetings are held at week-ends, particulars of which are contained in the Programme.

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Further information and Programme may be obtained from the General Secretary:—**H. A. TOOMBS, Dept. of Geology, British Museum (Natural History), Cromwell Road, S.W.7.**

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